The Harman Kardon Model hk 505

Integrated Amplifier

Technical Manual

harman/kardon

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough Power line leakage passing through the heating element may destroy the transistors.

2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.

3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.

4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.

5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.

6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

ALIGNMENT PROCEDURES

POWER AMPLIFIER IDLING ADJUSTMENT

INSTRUMENT 1. D. C. V. T. V. M.

NOTE
1. Set volume control to minimum position.
2. Connect 8 ohm (50W) resistors to left and ground, right and ground speaker terminals.

STEP	CONNECT OUTPUT METER TO	ADJUST	ADJUST FOR
1	D. C. V. T. V. M. to TP1 (+) and TP2 (–)	VR403	33 mV ± 1.6 mV
2	D. C. V. T. V. M. to TP 3(+) and TP4 (–)	VR404	Same as above

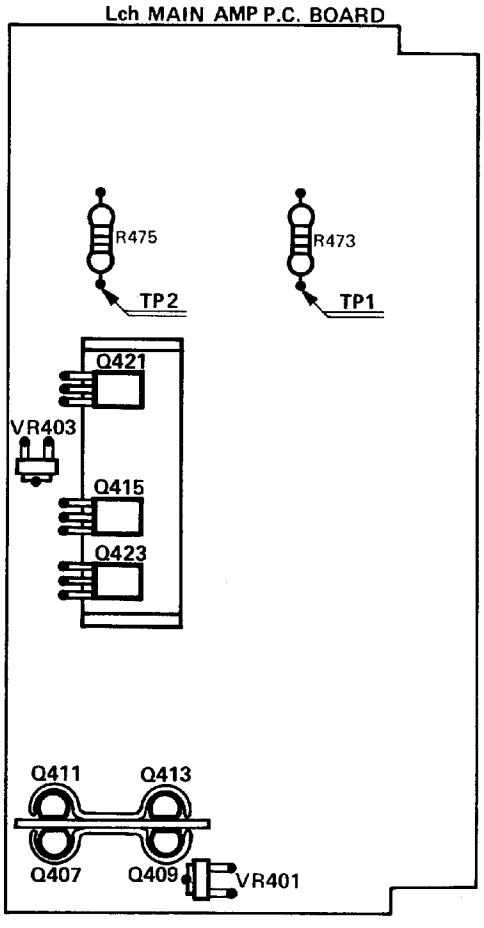
OUTPUT DC VOLTAGE ZERO ADJUSTMENT

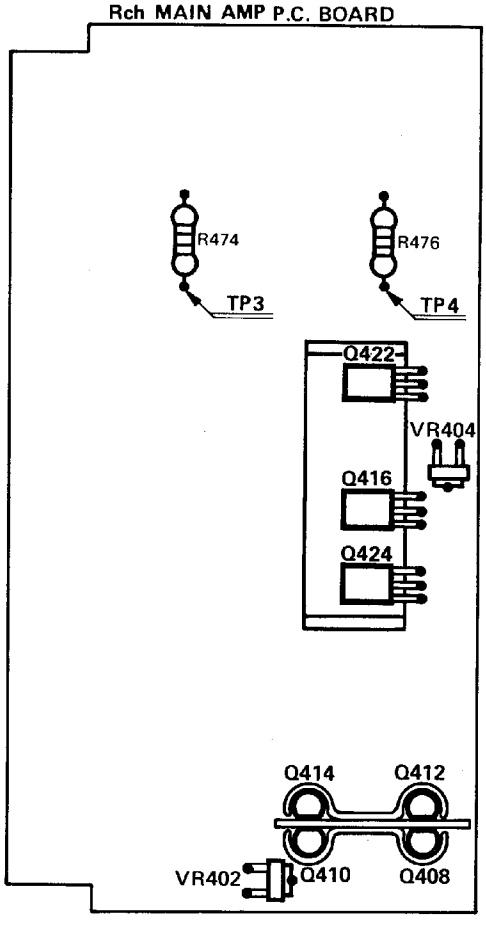
INSTRUMENT 1. D. C. V. T. V. M.

NOTE
1. Set volume control to minimum position.
2. Press in speaker 1 push button to ON (button in) position.

STEP	CONNECT OUTPUT METER TO	ADJUST	ADJUST FOR
1	D. C. V. T. V. M. to L CH terminal of speaker system 1	VR401	0V ± 20 mV
2	D. C. V. T. V. M. R CH terminal of speaker system 1	VR402	Same as above

ALIGNMENT POINTS





SCHEMATIC NOTES AND DIAGRAMS

1. All resistors are 1/4 watt, ± 5%, unless otherwise noted. Values are in ohms. K = 1000 M = 1000 K.
2. All capacitances values are in MF unless noted otherwise. PF = MMF.
3. Function selector switch (SW2) is in PHONO position.

VOLTAGE CHART

AC120V
No Signal
Chassis Ground

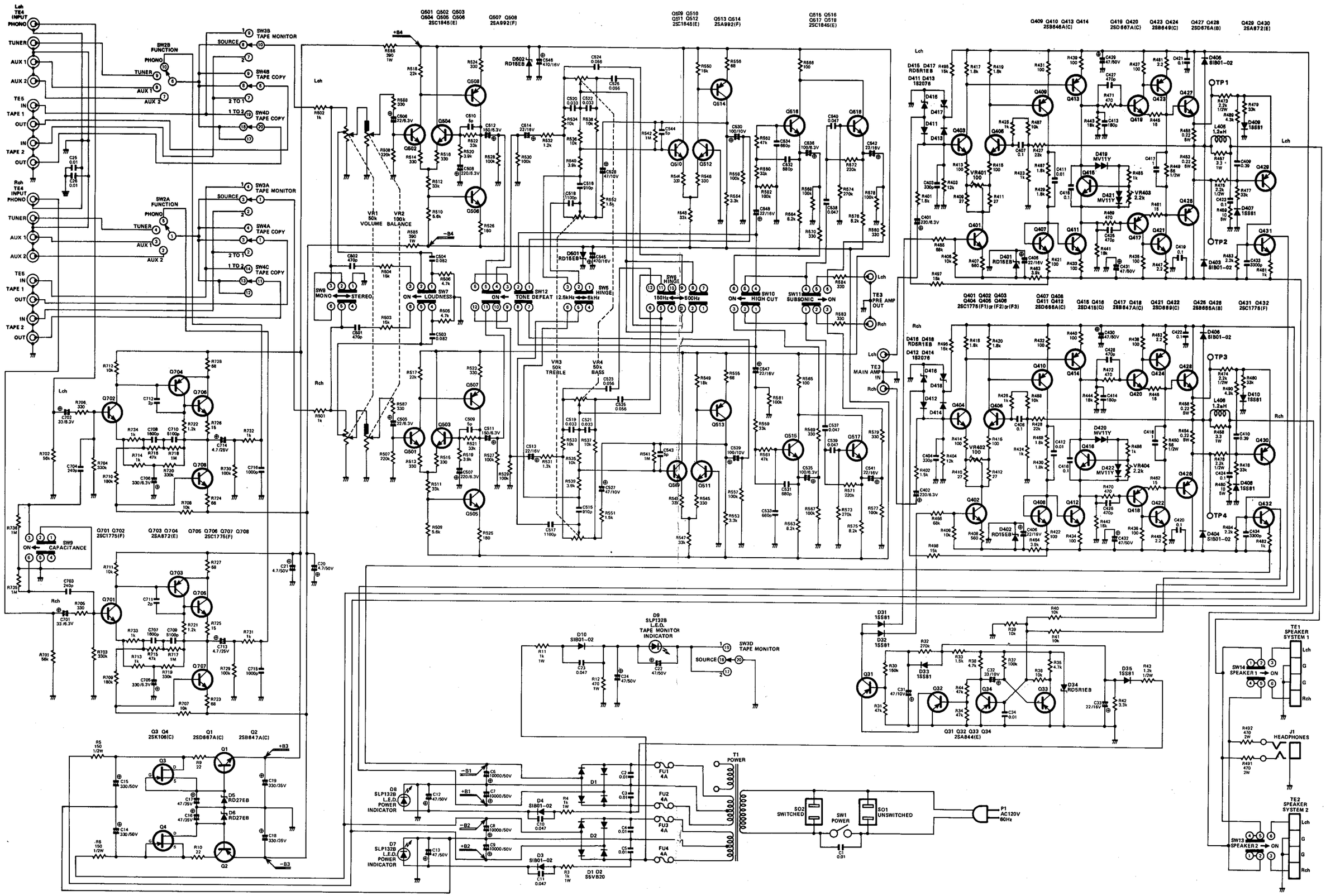
Volume Control at Minimum
Tone Controls at Mechanical Center

+B1 . . . . . +44.80V	-B1 . . . . . -44.80V
+B2 . . . . . +44.80V	-B2 . . . . . -44.80V
+B3 . . . . . +27.20V	-B3 . . . . . -27.20V
+B4 . . . . . +13.80V	-B4 . . . . . -13.80V

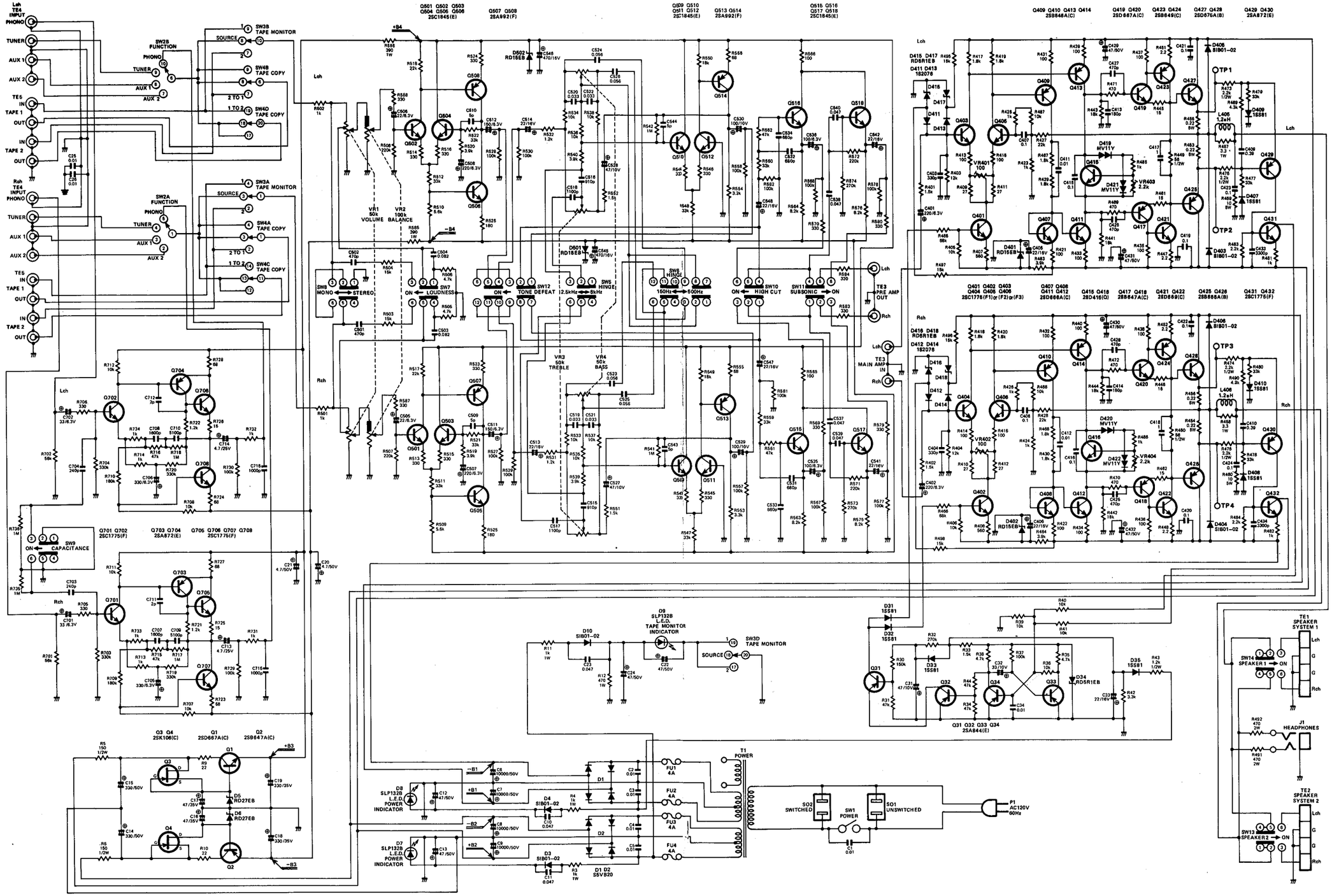
	BASE	EMITTER	COLLECTOR
Q1	+27.90V	+27.20V	+37.00V
Q2	-27.80V	-27.20V	-36.70V
Q31	- 0.67V	- 0.07V	- 0.17V
Q32	- 0.62V	0.0V	- 0.07V
Q33	- 0.55V	0.0V	- 0.07V
Q34	- 0.06V	0.0V	- 0.11V
Q401, 402	-12.38V	-13.01V	- 0.71V
Q403, 404	- 0.01V	- 0.60V	+43.30V
Q405, 406	- 0.01V	- 0.60V	+43.30V
Q407, 408	-43.70V	-44.20V	-43.70V
Q409, 410	+43.30V	+43.80V	-11.50V
Q411, 412	-43.70V	-43.90V	- 1.28V
Q413, 414	+43.30V	+44.00V	+ 1.28V
Q415, 416	- 0.67V	- 1.28V	+ 1.28V
Q417, 418	- 1.26V	- 0.71V	-44.10V
Q419, 420	+ 1.20V	+ 0.69V	+44.10V
Q421, 422	-44.10V	-44.20V	- 0.61V
Q423, 424	+44.10V	+44.20V	+ 0.61V
Q425, 426	- 0.61V	- 0.02V	-44.80V
Q427, 428	+ 0.61V	+ 0.02V	+44.80V
Q429, 430	- 0.01V	+ 0.02V	-44.80V
Q431, 432	-44.80V	-44.80V	- 0.05V
Q501, 502	- 0.06V	- 0.6V	+10.92V
Q503, 504	- 0.04V	- 0.6V	+13.80V
Q505, 506	-12.05V	-12.52V	- 0.03V
Q507, 508	+10.92V	+11.56V	- 0.03V
Q509, 510	+ 0.13V	- 0.43V	+13.80V
Q511, 512	0.0V	- 0.52V	+12.88V
Q513, 514	+12.88V	+13.79V	+ 0.67V
Q515, 516	- 0.44V	- 1.04V	+13.50V
Q517, 518	- 0.65V	- 1.25V	+13.50V
Q701, 702	- 0.05V	- 0.62V	+25.87V
Q703, 704	+25.87V	+26.57V	+ 1.67V
Q705, 706	+ 1.67V	+ 1.13V	+26.57V
Q707, 708	-25.87V	-26.49V	+ 1.13V

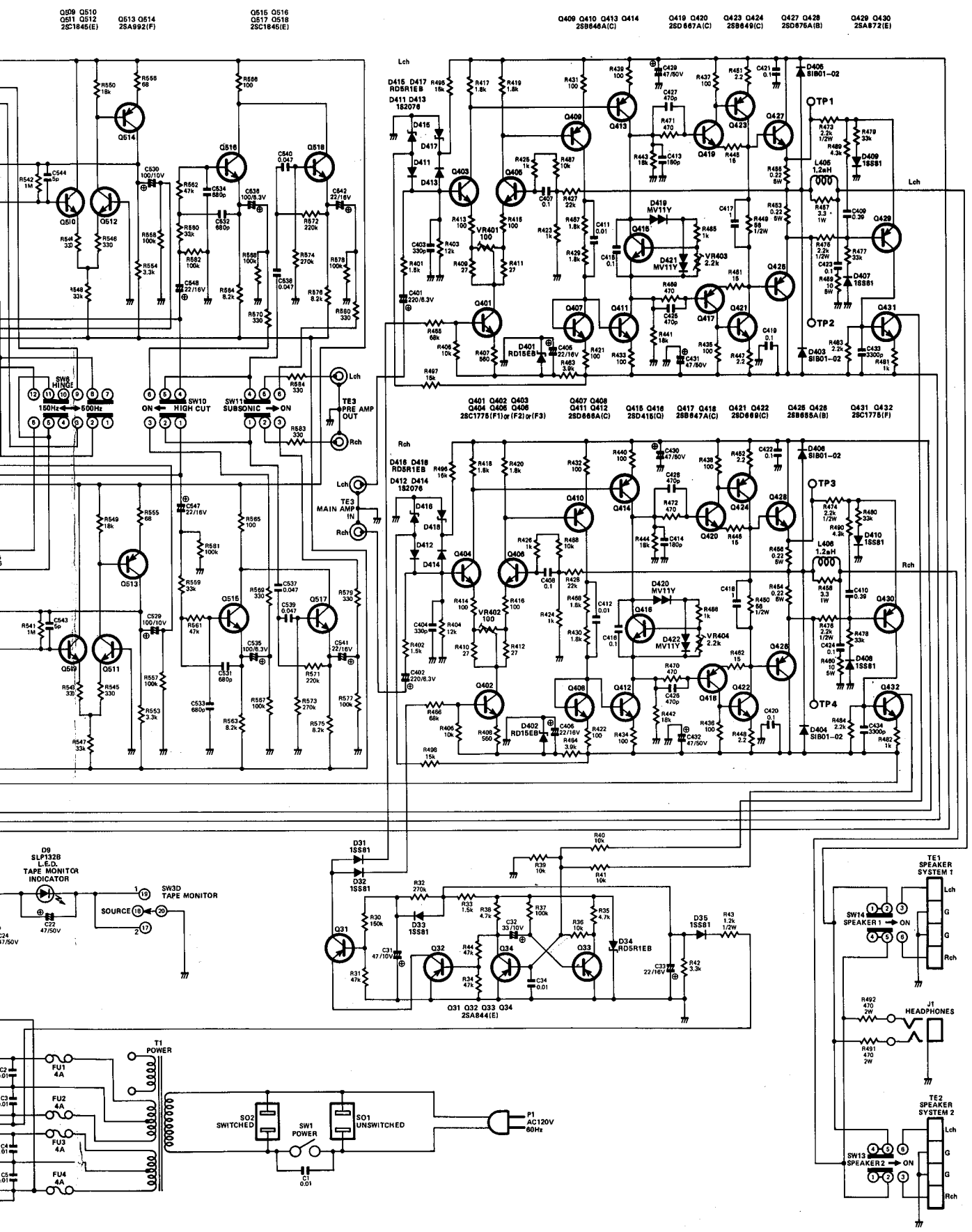
	GATE	SOURCE	DRAIN
Q3	+27.90V	+27.90V	+38.10V
Q4	-37.80V	-37.80V	-27.80V

SCHEMATIC DIAGRAM

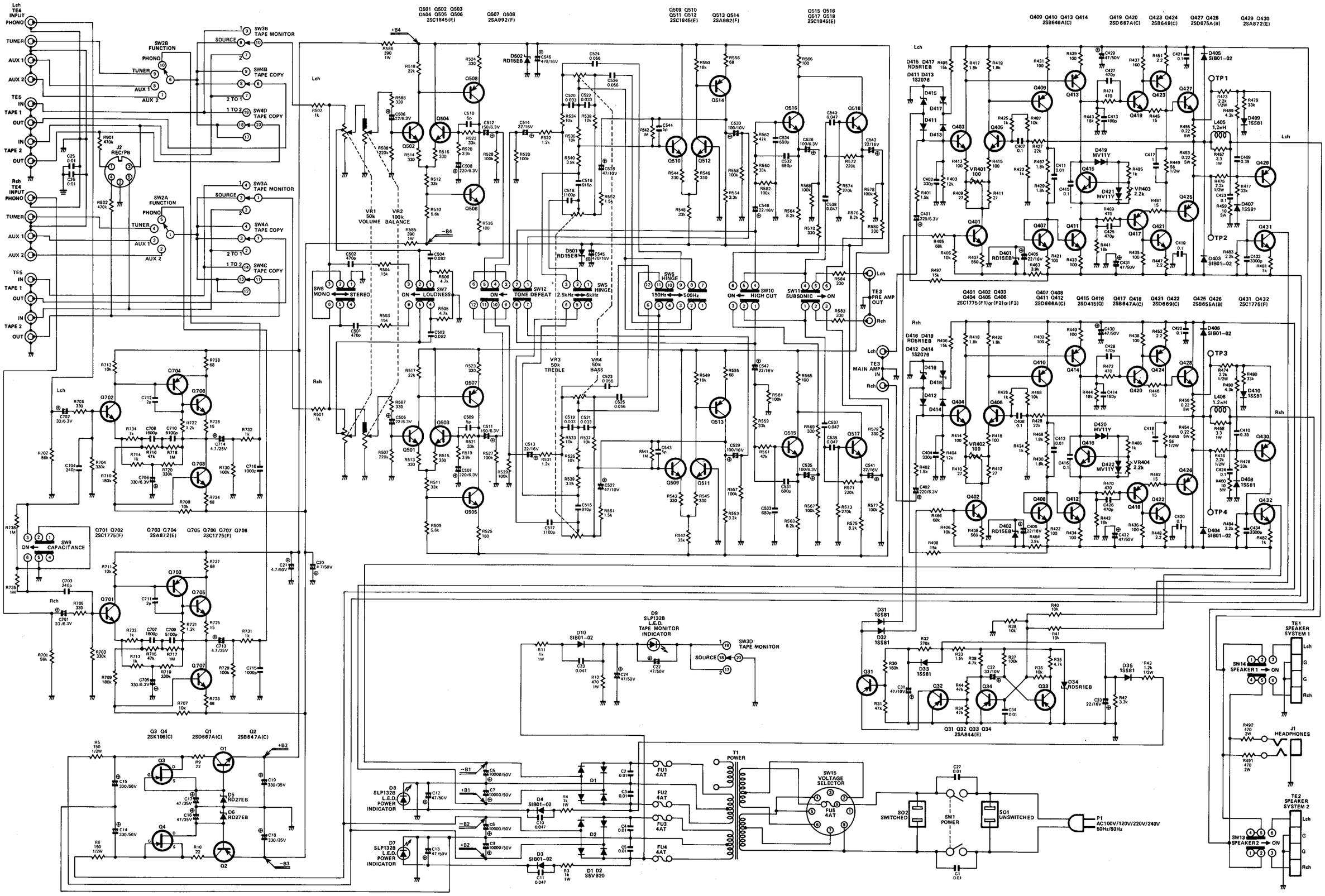


SCHEMATIC DIAGRAM

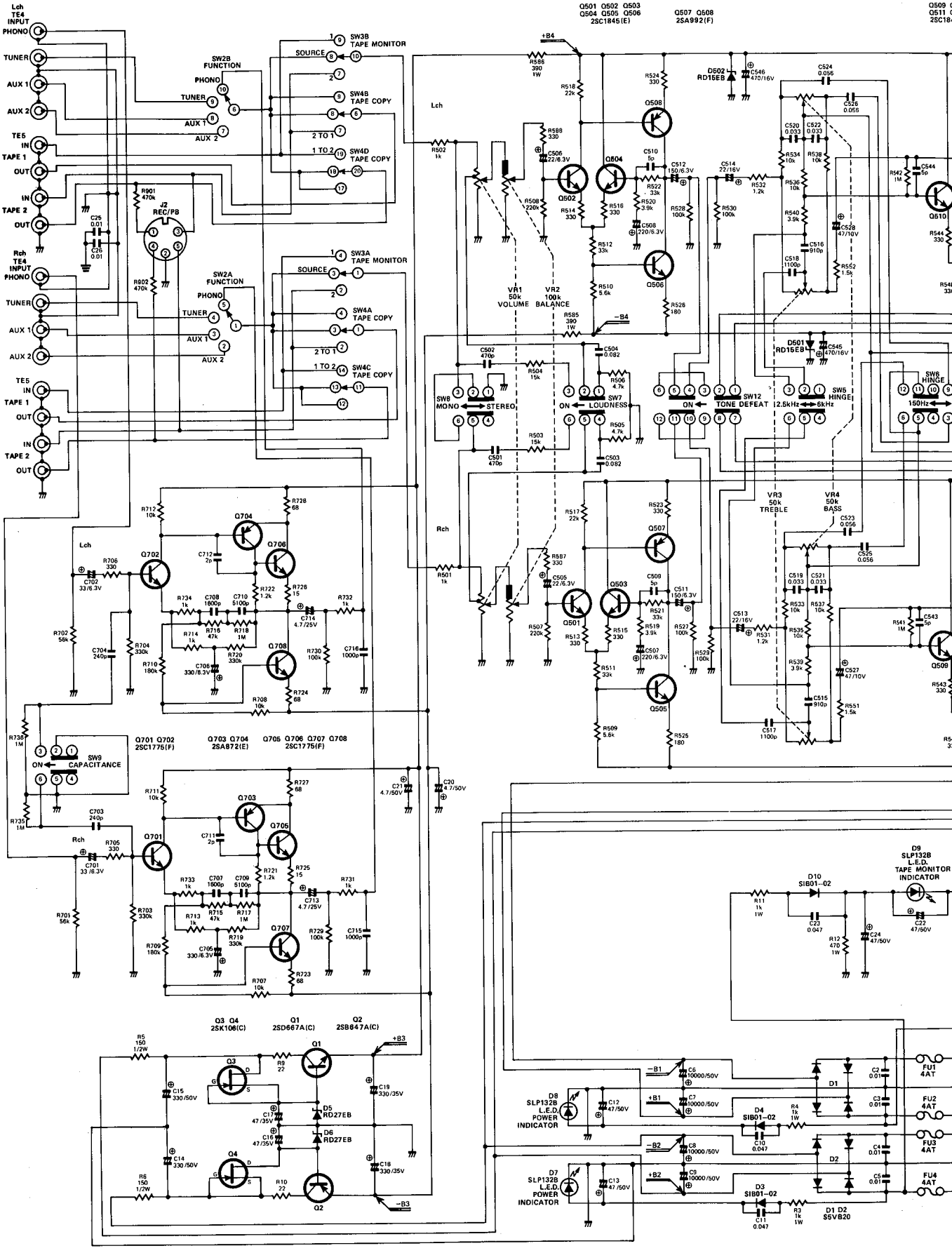


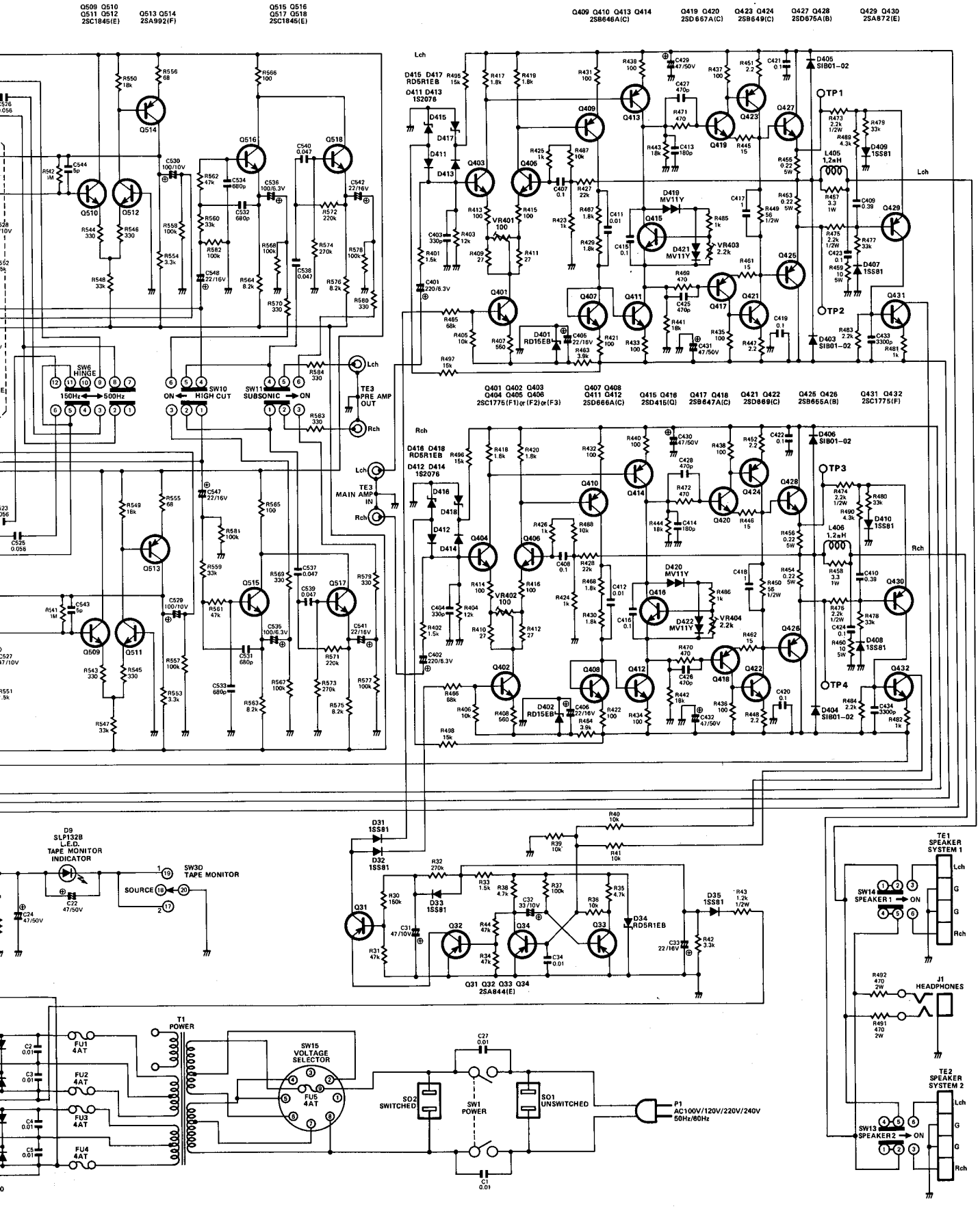

Q509 Q510
Q511 Q512
2SC1845(E)
Q513 Q514
2SA992(F)
Q515 Q516
Q517 Q518
2SC1845(E)
Q409 Q410 Q413 Q414
2SB646A(C)
Q419 Q420
2SD667A(C)
Q423 Q424
2SB649(C)
Q427 Q428
2SD675A(B)
Q429 Q430
2SA872(E)
Lch
Rch
TE3
PRE AMP
OUT
TE3
MAIN AMP
IN
SW6
HINGE
150Hz
500Hz
SW10
HIGH CUT
SW11
SUBSONIC
ON
TP1
TP2
TP3
TP4
Q401 Q402 Q403
Q404 Q406 Q406
2SC1775(F1) or (F2) or (F3)
Q407 Q408
Q411 Q412
2SD666A(C)
Q415 Q416
2SD415(Q)
Q417 Q418
2SB647A(C)
Q421 Q422
2SD669(C)
Q426 Q428
2SB655A(B)
Q431 Q432
2SC1775(F)
D9
SLP1328
L.E.D.
TAPE MONITOR
INDICATOR
SW3D
TAPE MONITOR
SOURCE
Q31 Q32 Q33 Q34
2SA844(E)
T1
POWER
FU1
4A
FU2
4A
FU3
4A
FU4
4A
SO2
SWITCHED
SW1
POWER
SO1
UNSWITCHED
P1
AC120V
60Hz
TE1
SPEAKER
SYSTEM 1
SW14
SPEAKER 1
ON
J1
HEADPHONES
TE2
SPEAKER
SYSTEM 2
SW13
SPEAKER2
ON
Lch
G
G
Rch

SCHEMATIC DIAGRAM – MULTI VOLTAGE



SCHEMATIC DIAGRAM – MULTI VOLTAGE




Q509 Q510
Q511 Q512
2SC1845(E)
Q513 Q514
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Q515 Q516
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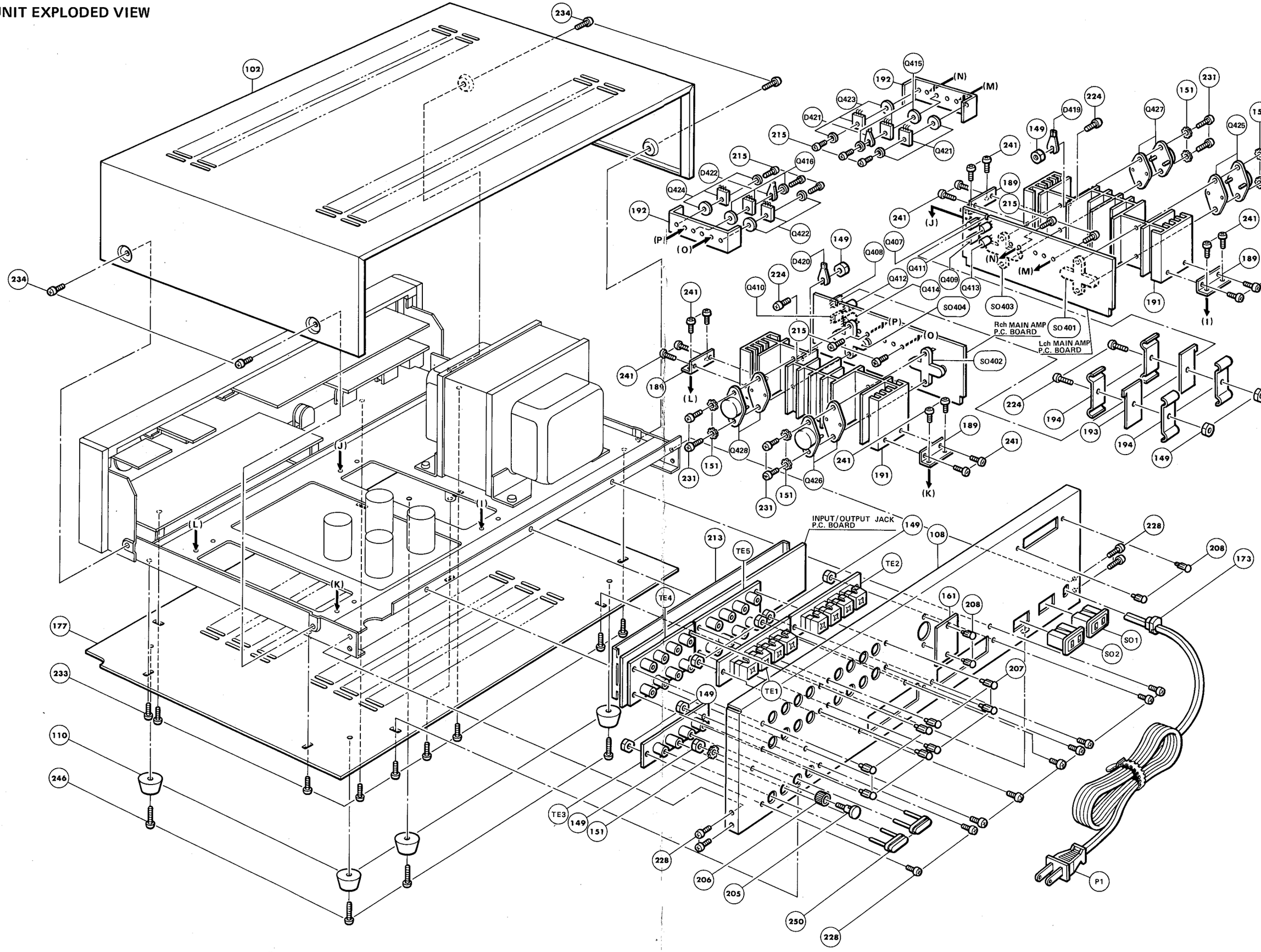
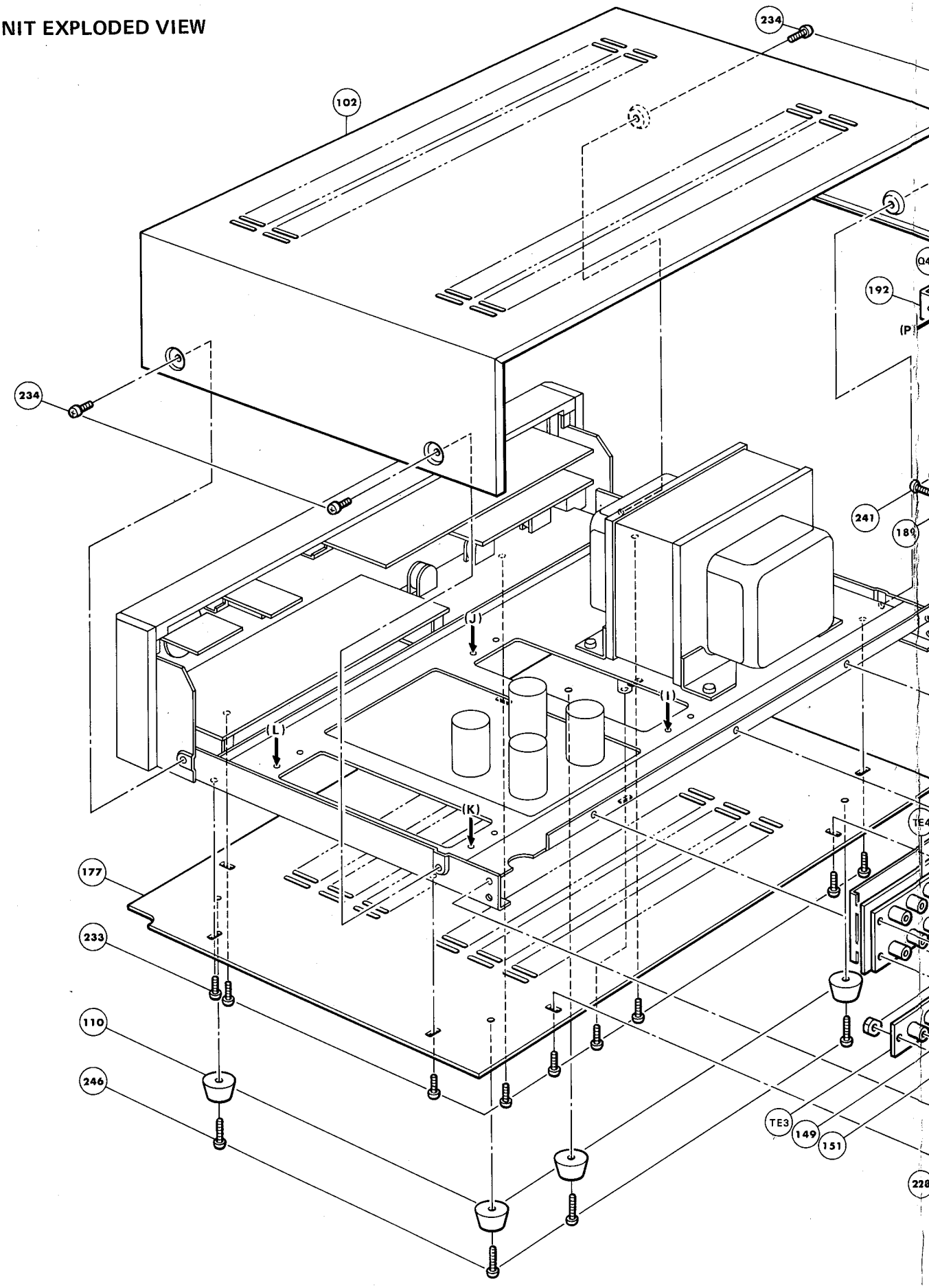
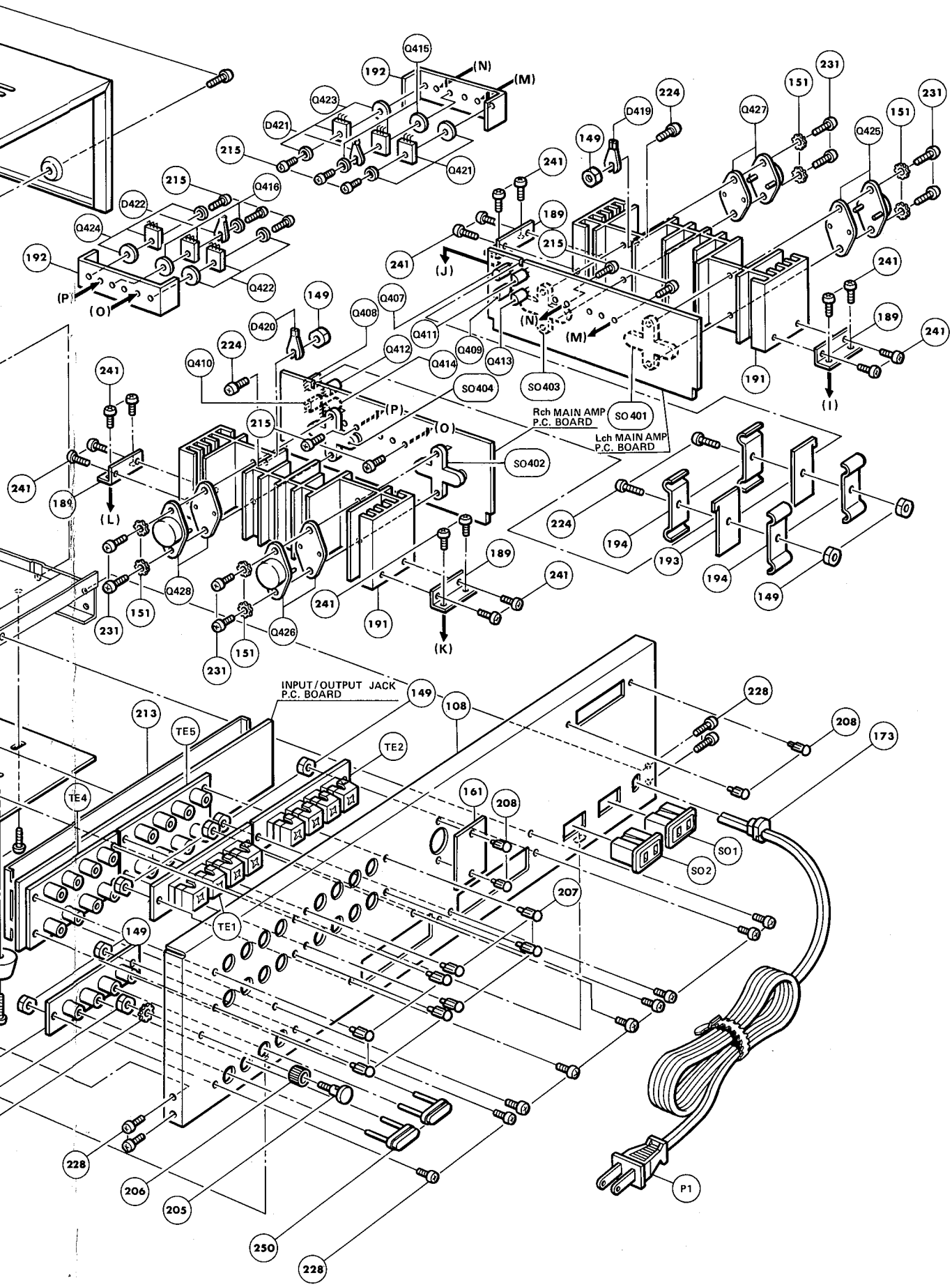
Q409 Q410 Q413 Q414
2SB646A(C)
Q419 Q420
2SD667A(C)
Q423 Q424
2SB649(C)
Q427 Q428
2SD675A(B)
Q429 Q430
2SA872(E)
Lch
Rch
TP1
TP2
TP3
TP4
L405 1.2mH
L406 1.2mH
SW6 HINGE
150Hz 500Hz
SW10 HIGH CUT
ON
SW11 SUBSONIC ON
TE3 PRE AMP OUT
TE3 MAIN AMP IN
Q401 Q402 Q403
Q404 Q405 Q406
2SC1775(F1) or (F2) or (F3)
Q407 Q408
Q411 Q412
2SD666A(C)
Q415 Q416
2SD415(Q)
Q417 Q418
2SB647A(C)
Q421 Q422
2SD669(C)
Q425 Q426
2SB655A(B)
Q431 Q432
2SC1775(F)
D9
SLP132B
L.E.D.
TAPE MONITOR
INDICATOR
SW30
TAPE MONITOR
SOURCE
Q31 Q32 Q33 Q34
2SA844(E)
T1
POWER
SW15
VOLTAGE
SELECTOR
FU1 4AT
FU2 4AT
FU3 4AT
FU4 4AT
FU5 4AT
SO2
SWITCHED
SW1
POWER
SO1
UNSWITCHED
P1
AC100V/120V/220V/240V
50Hz/60Hz
TE1
SPEAKER
SYSTEM 1
SW14
SPEAKER1 ON
J1
HEADPHONES
TE2
SPEAKER
SYSTEM 2
SW13
SPEAKER2 ON

GENERAL UNIT EXPLODED VIEW

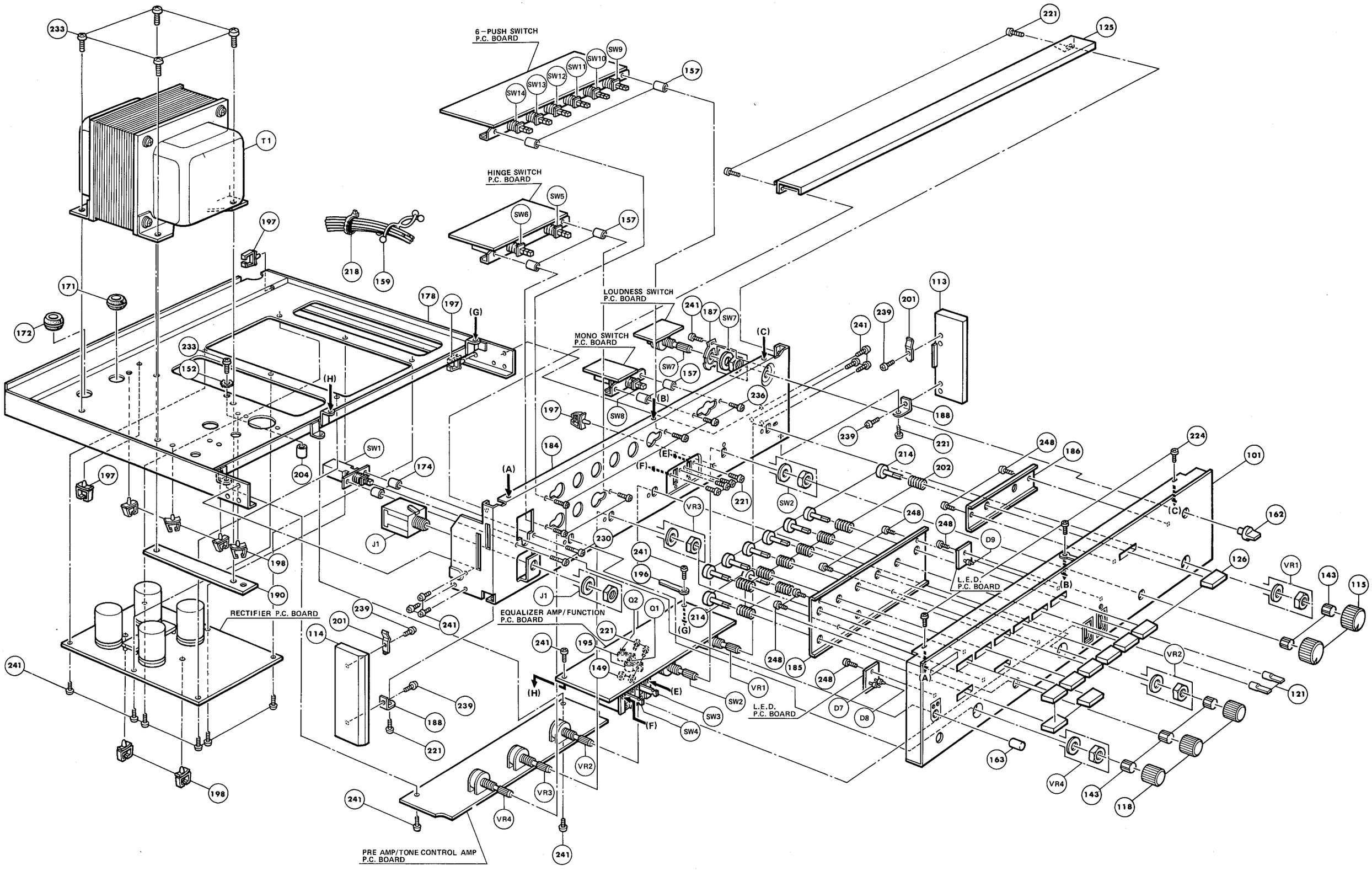


GENERAL UNIT EXPLODED VIEW

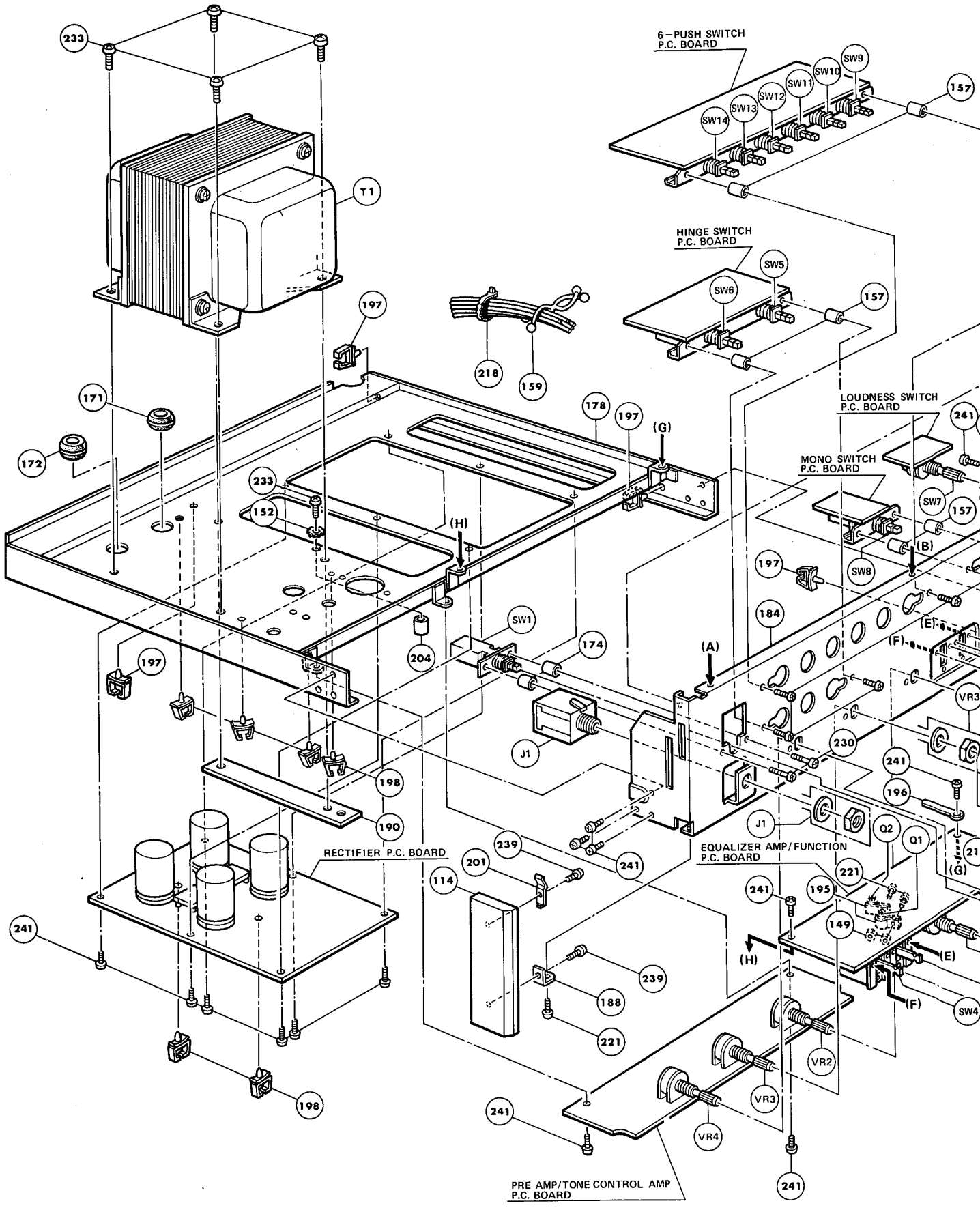


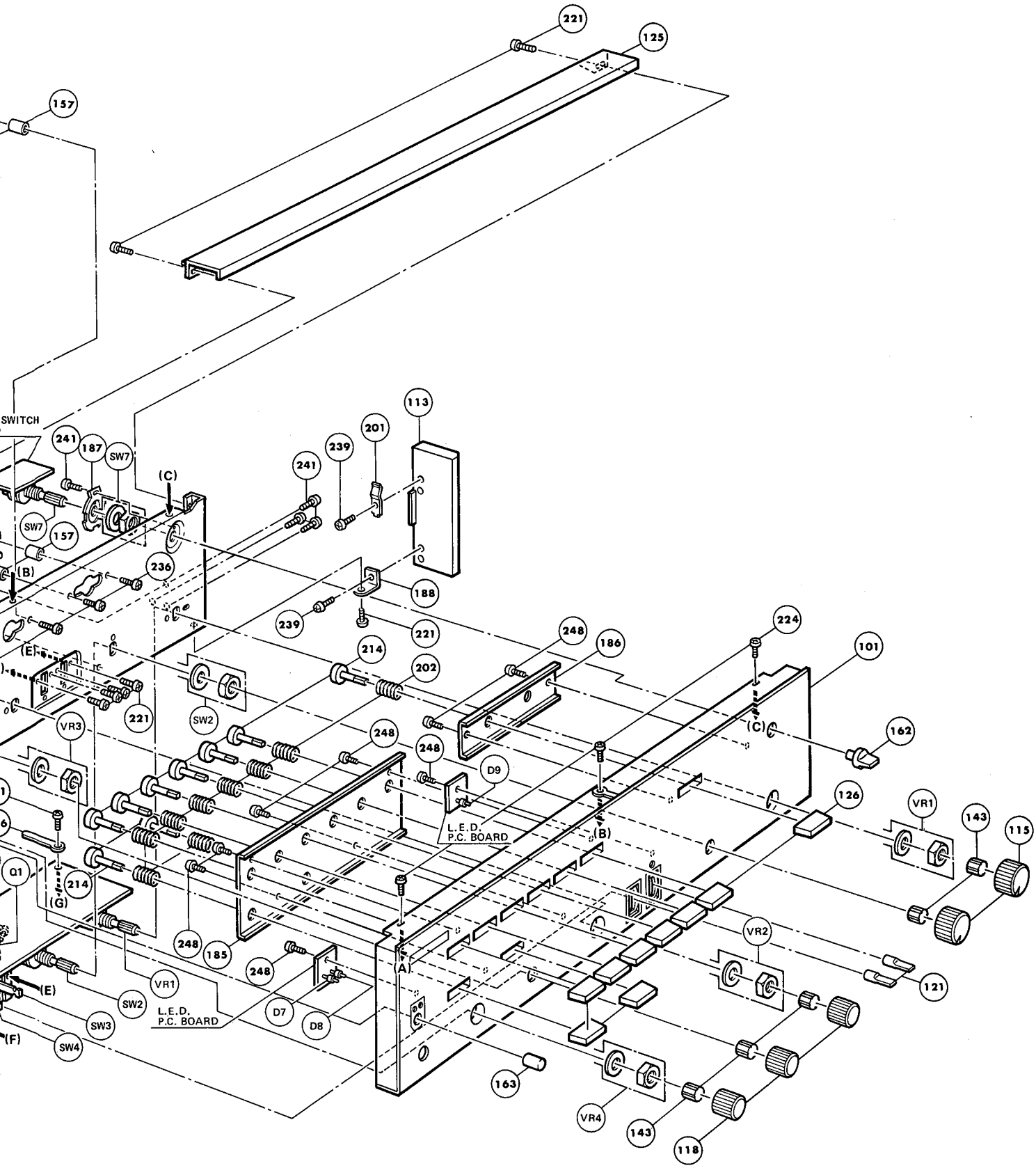

Q415
192
(N)
(M)
Q423
D421
215
Q421
D422
215
Q416
Q424
192
(P)
(O)
Q422
149
D420
Q408
Q407
Q411
Q412
Q414
Q409
Q413
224
Q410
241
(P)
(O)
215
SO404
SO403
SO402
Rch MAIN AMP P.C. BOARD
SO401
Lch MAIN AMP P.C. BOARD
241
189
(L)
Q428
231
151
Q426
231
151
241
189
191
(K)
224
194
193
194
149
241
(J)
(N)
(M)
D419
224
149
241
189
215
Q427
151
231
Q425
151
231
241
189
241
191
(I)
INPUT/OUTPUT JACK P.C. BOARD
149
108
213
TE5
TE2
TE4
TE1
149
161
208
SO1
SO2
207
228
208
173
228
206
205
250
228
P1

GENERAL UNIT EXPLODED VIEW



GENERAL UNIT EXPLODED VIEW

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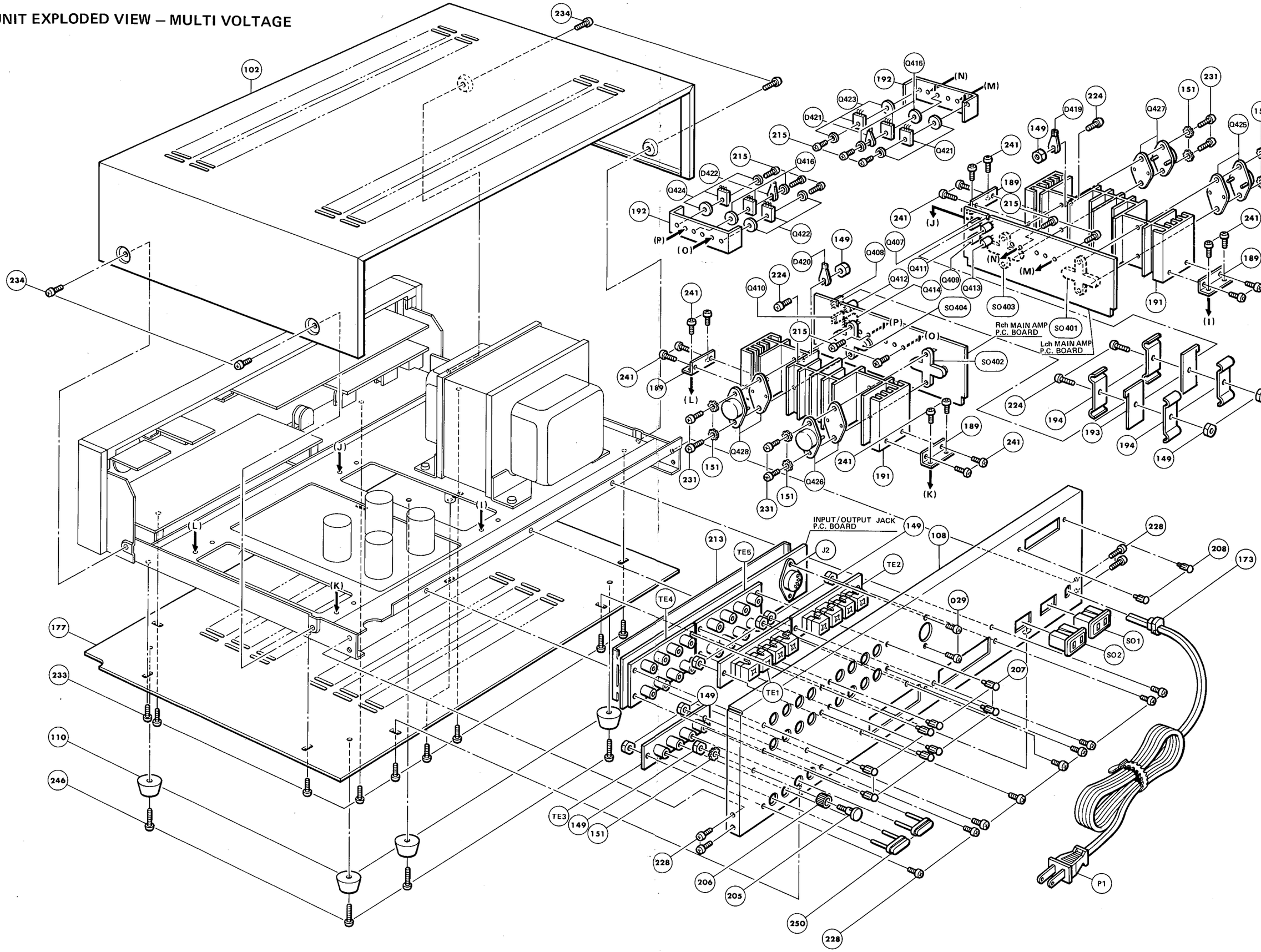
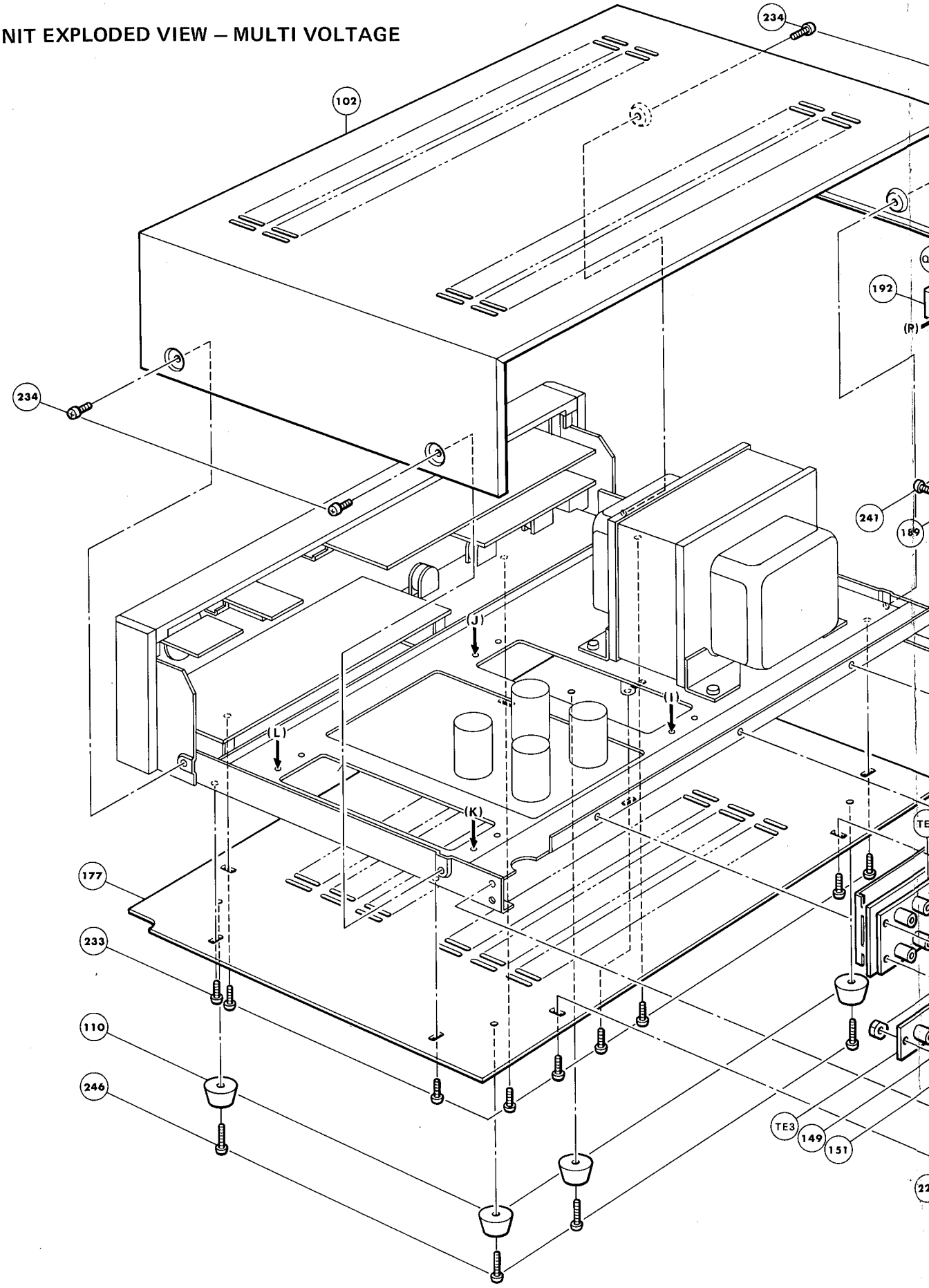
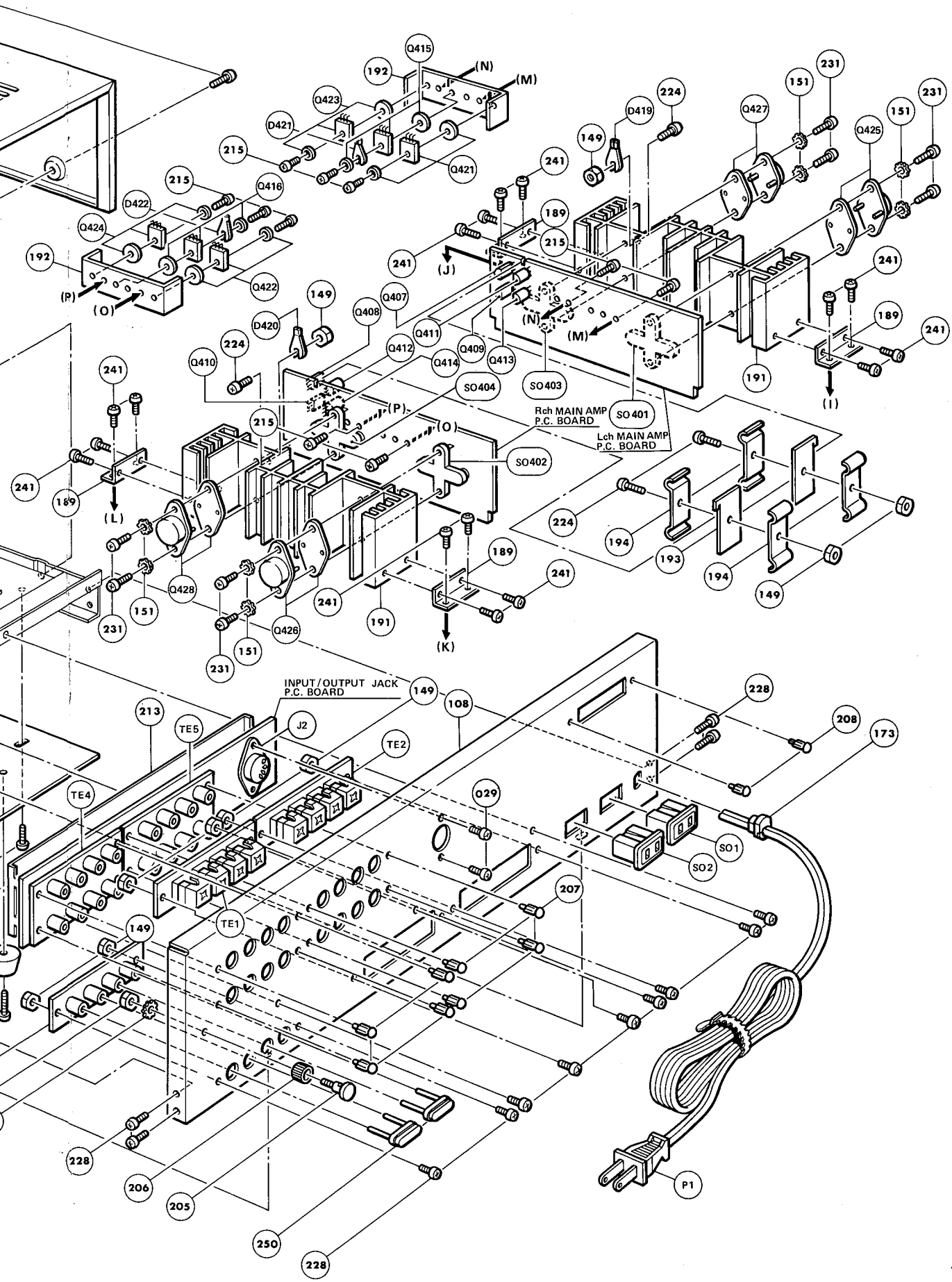
125
157
SWITCH
241
187
SW7
(C)
239
201
113
SW7
157
(B)
236
188
239
221
(E)
214
202
248
186
224
101
221
SW2
VR3
248
248
D9
(C)
162
126
VR1
143
115
L.E.D.
P.C. BOARD
(B)
Q1
214
(G)
248
185
248
VR2
121
VR1
(E)
SW2
SW3
(F)
SW4
L.E.D.
P.C. BOARD
D7
D8
(A)
163
VR4
143
118

GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE

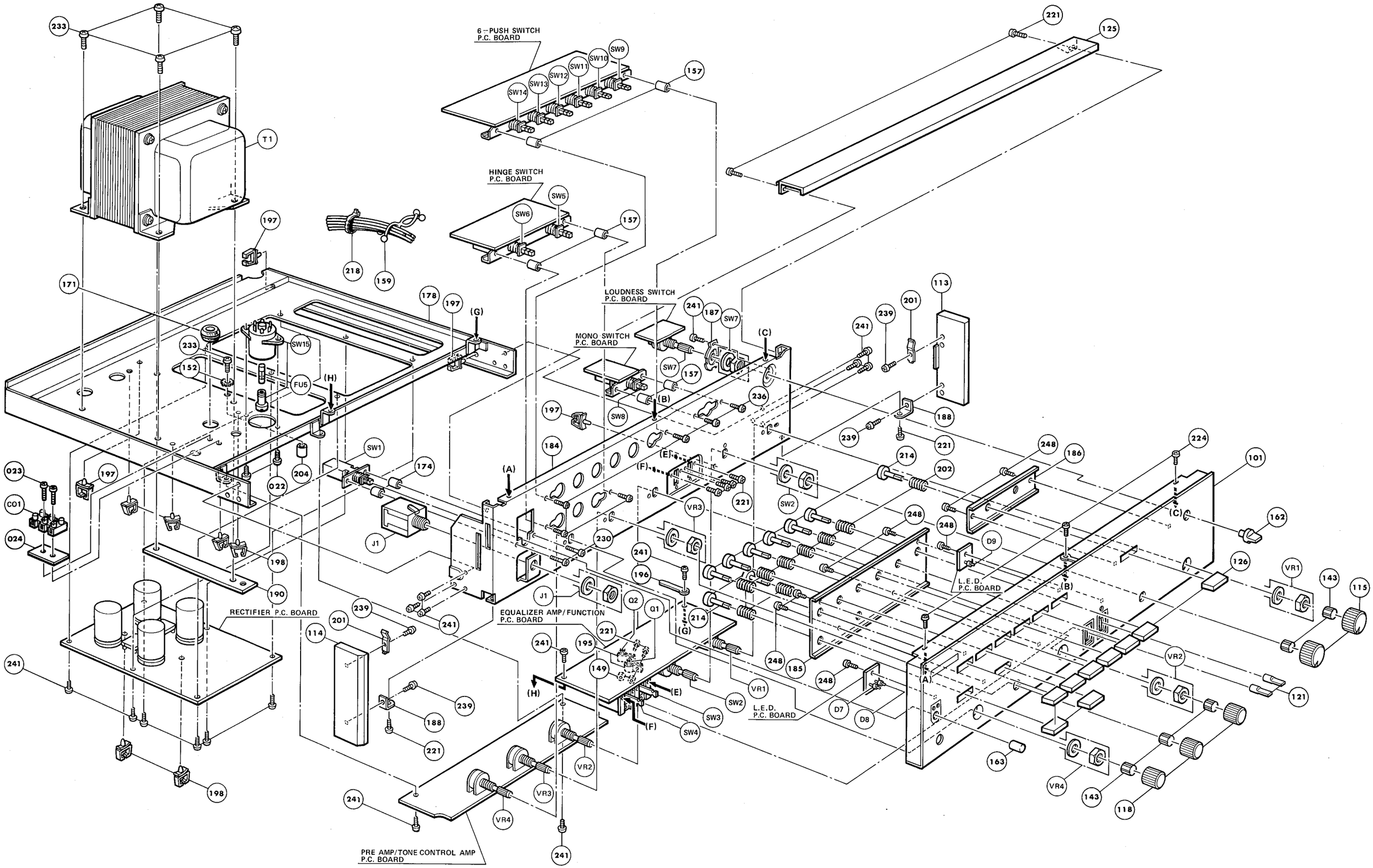


GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE

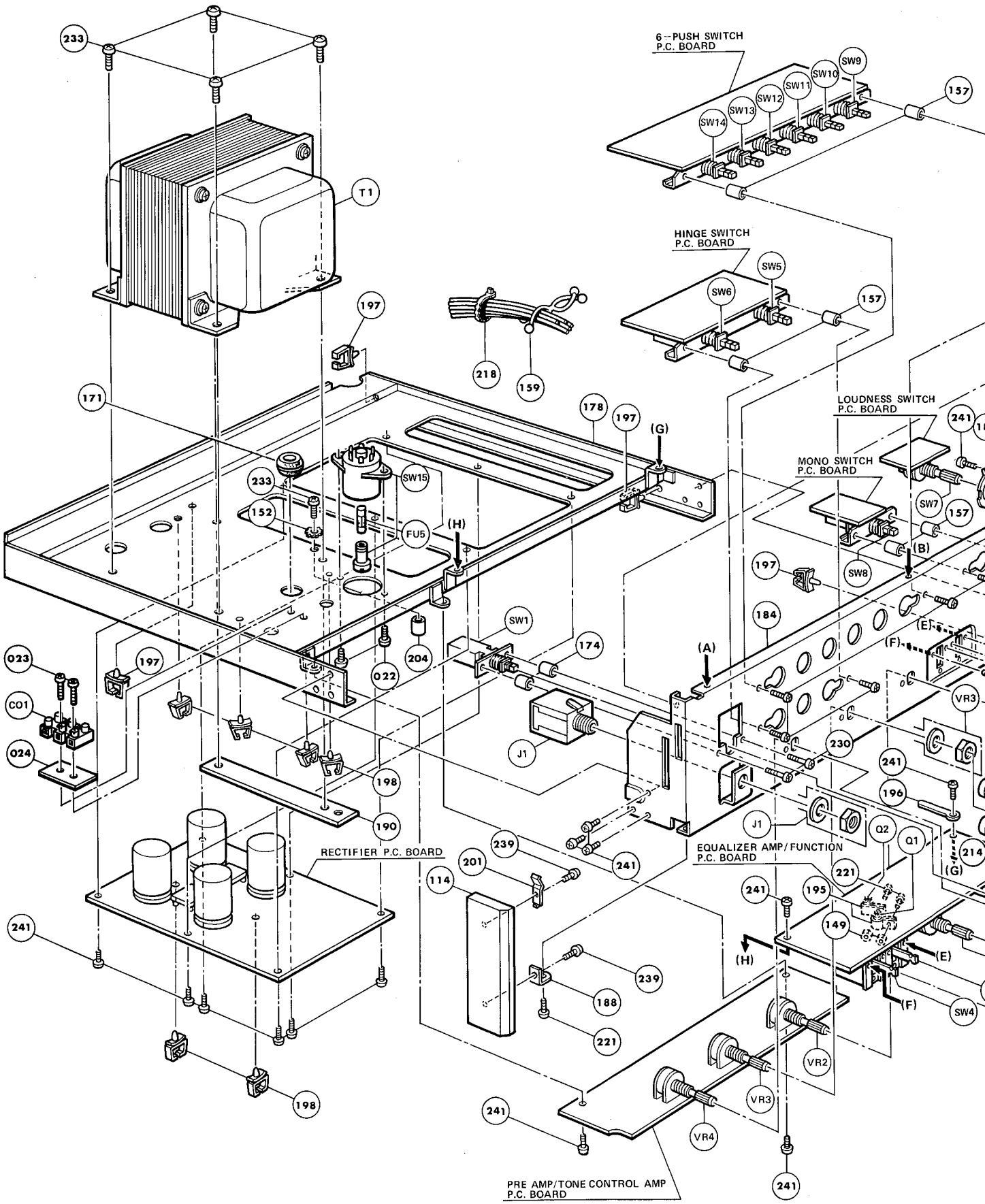


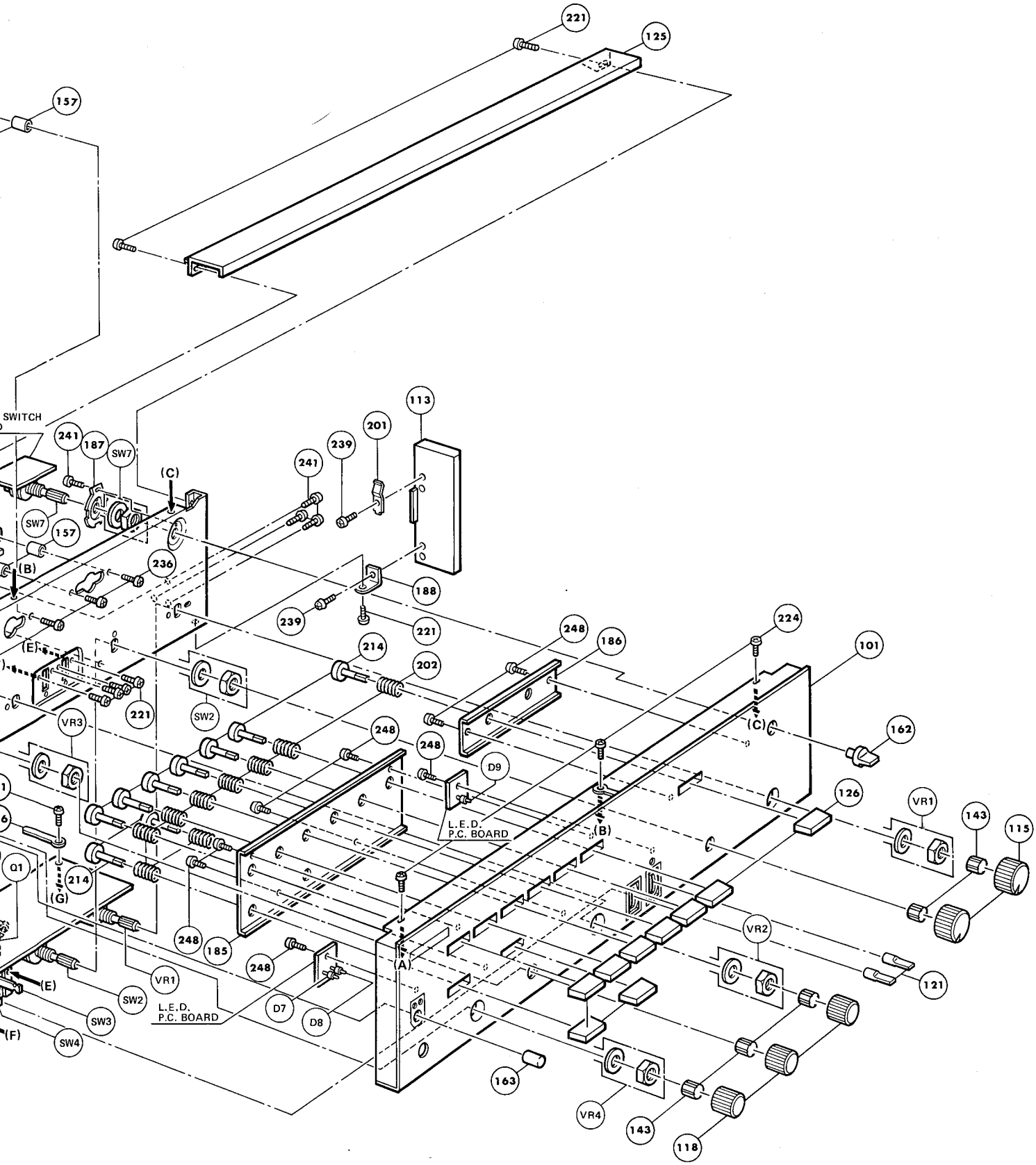

Q415
192
(N)
(M)
Q423
D421
215
Q421
D419
224
149
241
Q427
151
231
Q425
151
231
215
Q416
D422
Q424
192
(P)
(O)
Q422
241
189
215
(J)
(N)
(M)
241
189
241
191
(I)
149
Q407
Q408
D420
Q411
Q409
Q413
Q410
224
Q412
Q414
SO404
SO403
Rch MAIN AMP P.C. BOARD
SO401
Lch MAIN AMP P.C. BOARD
241
(P)
(O)
215
SO402
241
189
(L)
224
194
193
194
149
189
241
Q428
231
151
241
191
(K)
Q426
231
151
INPUT/OUTPUT JACK P.C. BOARD
149
108
213
TE5
J2
TE2
228
208
173
TE4
029
SO1
SO2
207
149
TE1
228
206
205
250
228
P1

GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE



GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE




221
125
157
SWITCH
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SW7
(C)
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(B)
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239
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(E)
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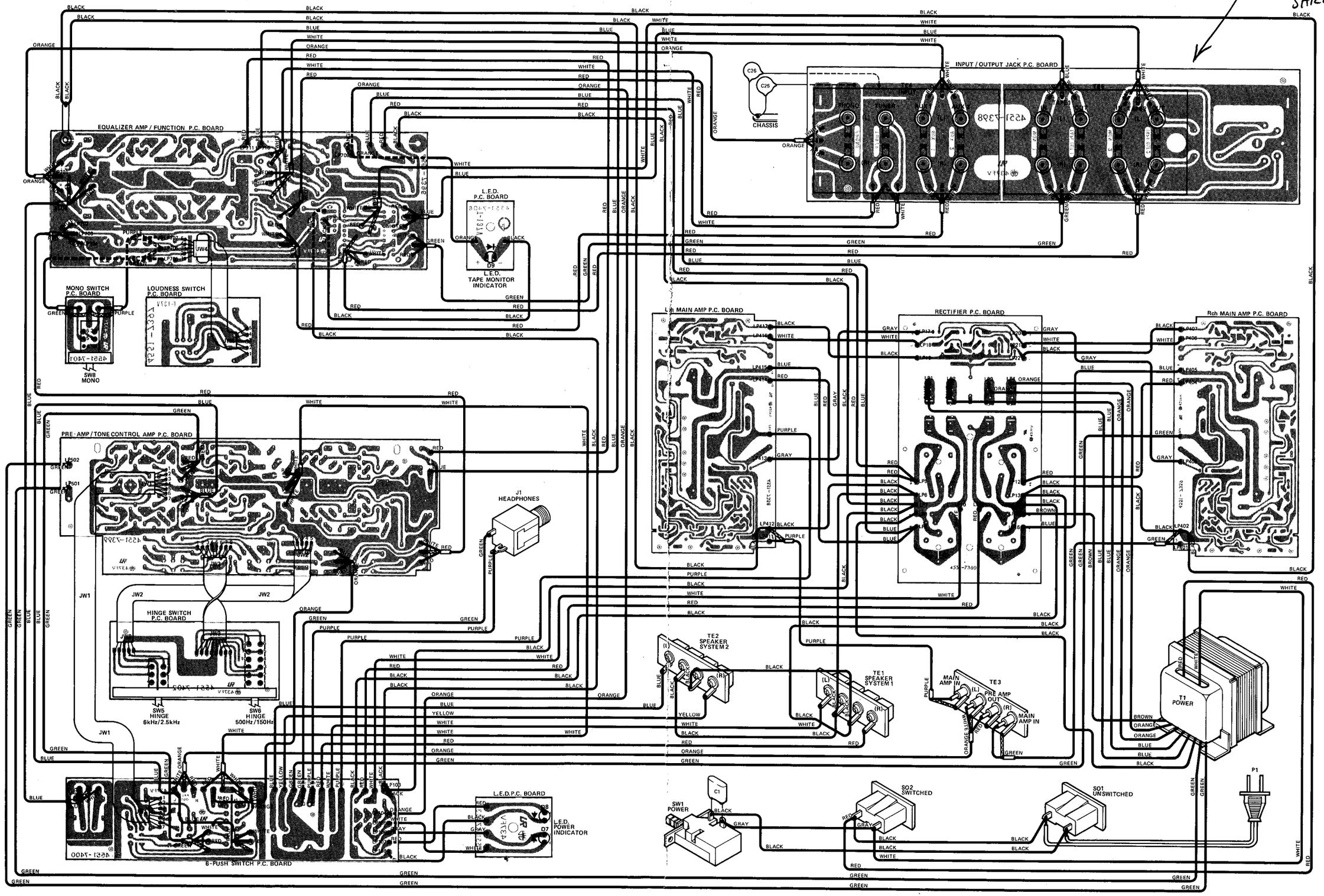
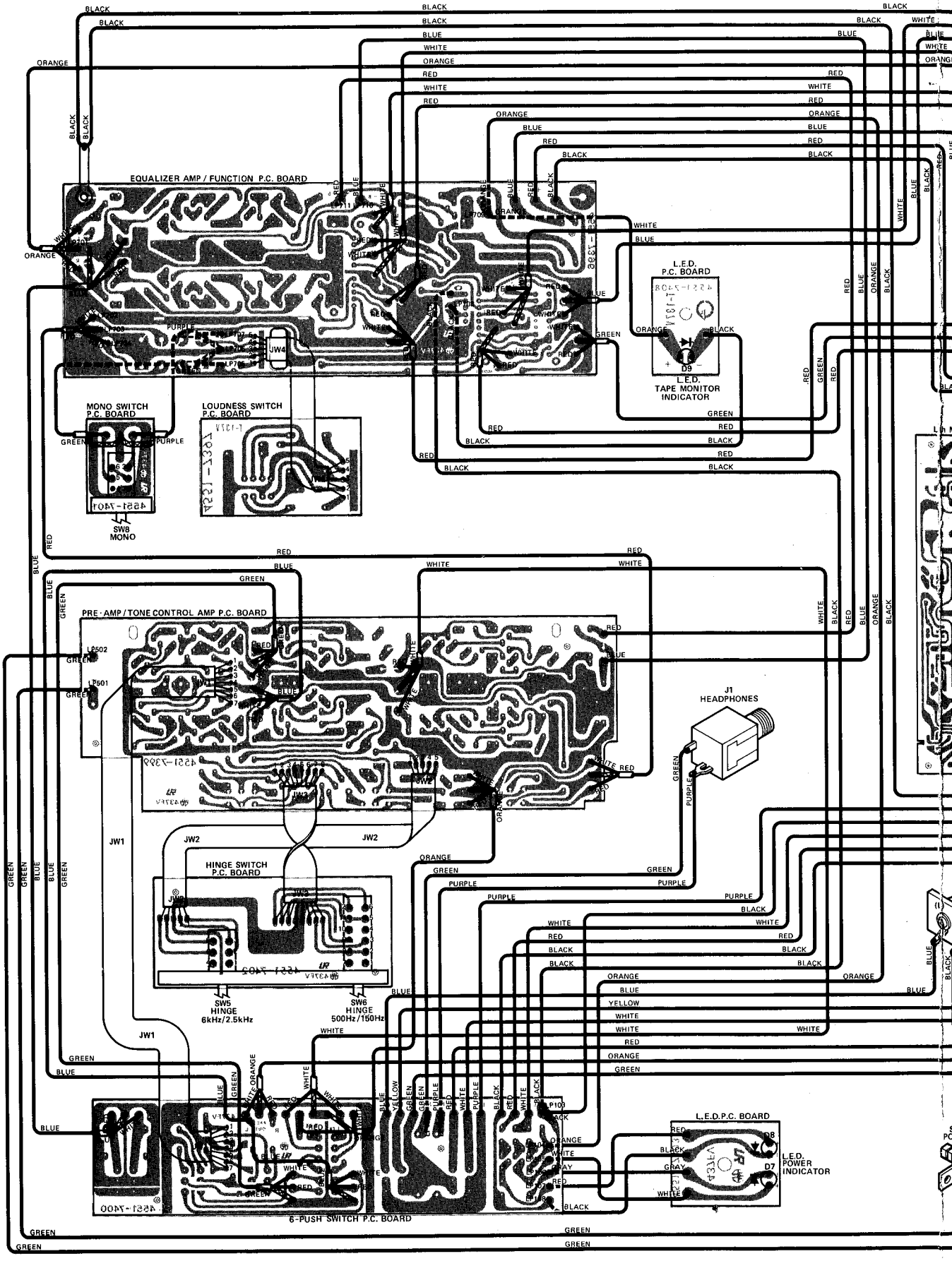
SW2
VR3
248
248
D9
(C)
162
126
VR1
143
115
L.E.D.
P.C. BOARD
(B)
Q1
214
(G)
248
185
248
(A)
VR2
121
VR1
(E)
SW2
SW3
L.E.D.
P.C. BOARD
D7
D8
(F)
SW4
163
VR4
143
118

WIRING DIAGRAM

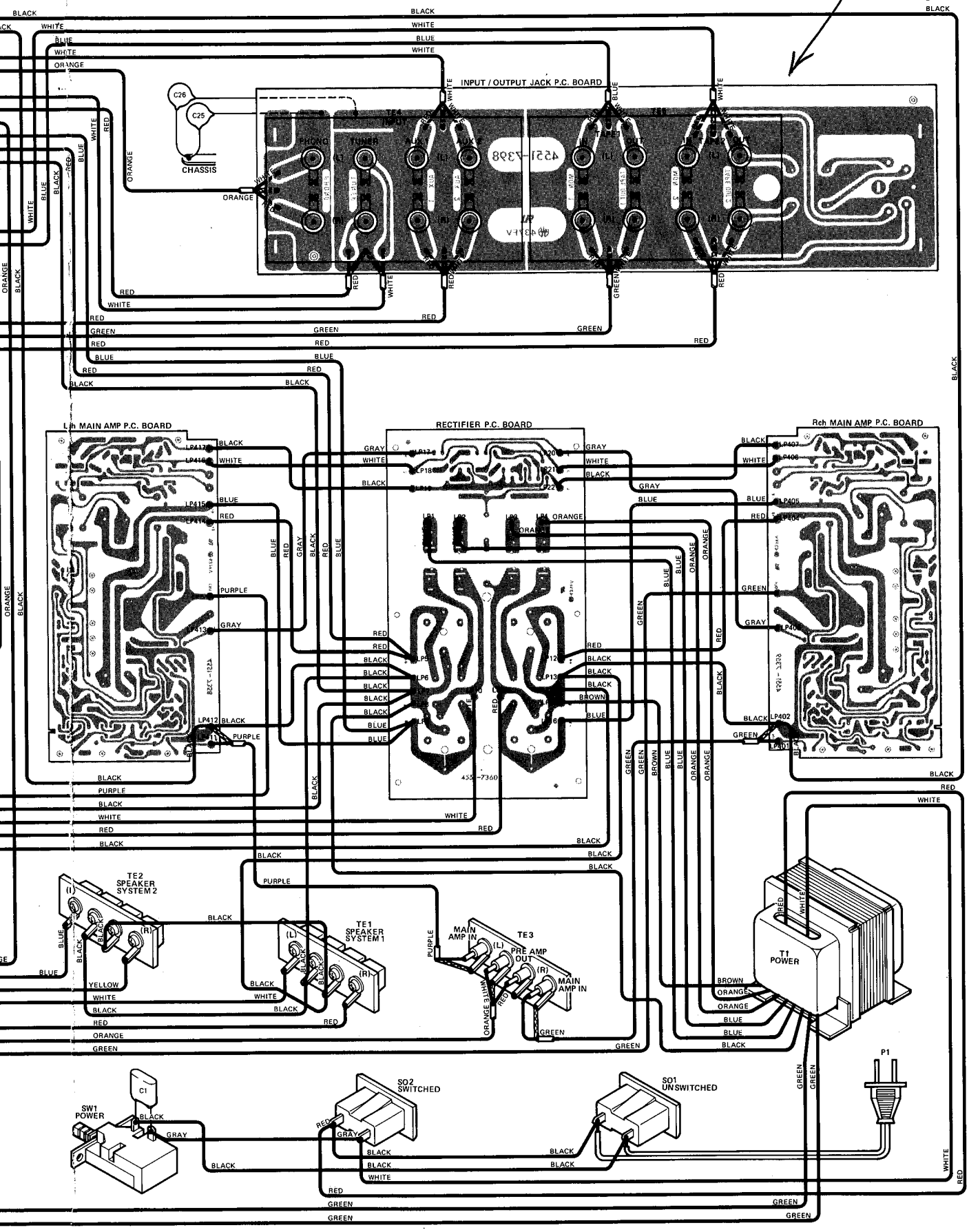
IF UNIT OSCILLATES WHEN FIRST TURNED ON W/ FUNCT. SW. IN PHONO MODE, ADD .01 mfd disc FROM INPUT JACK BD. SHIELD TO CHASSIS GND TAB NEAR TOP REAR.



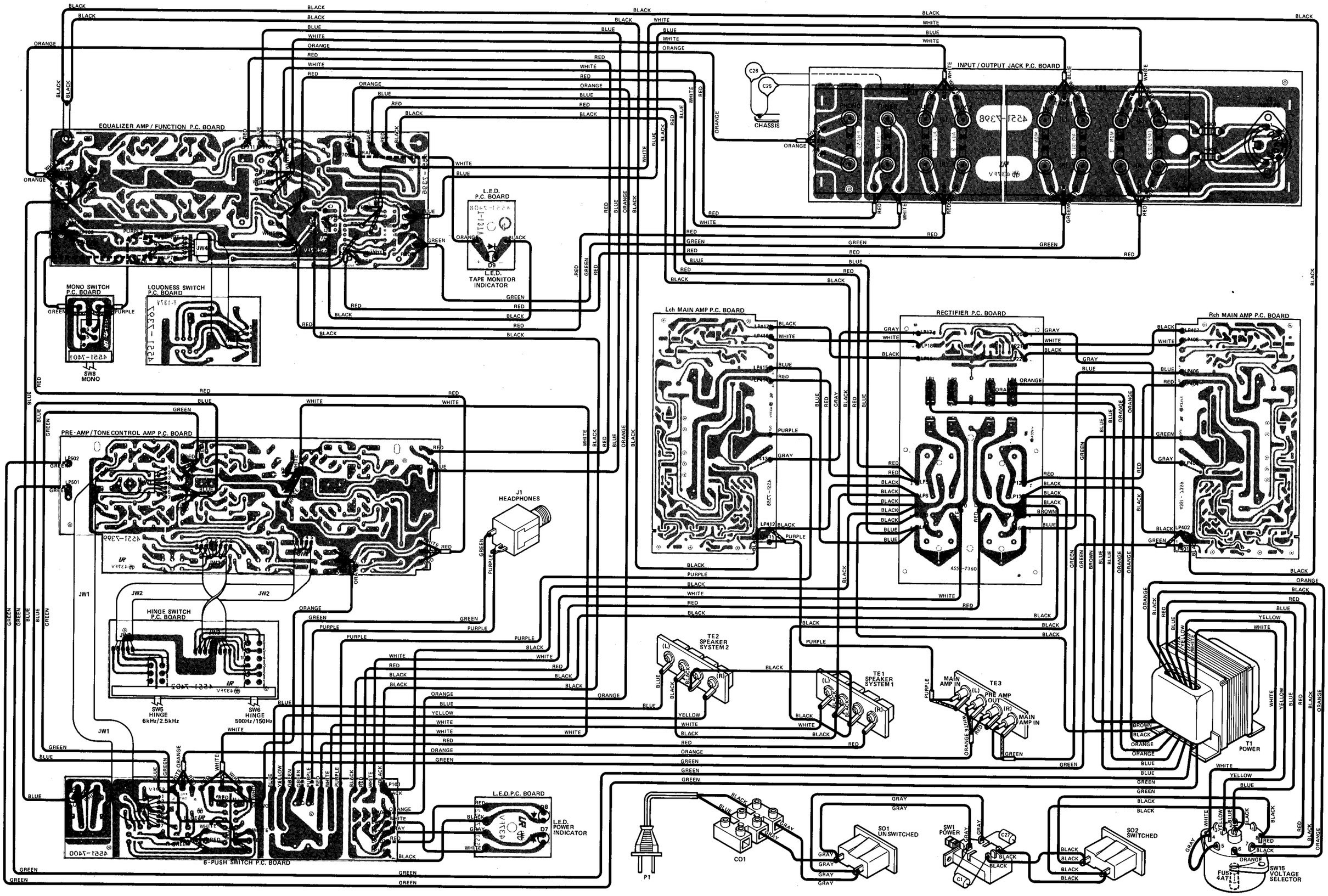
WIRING DIAGRAM



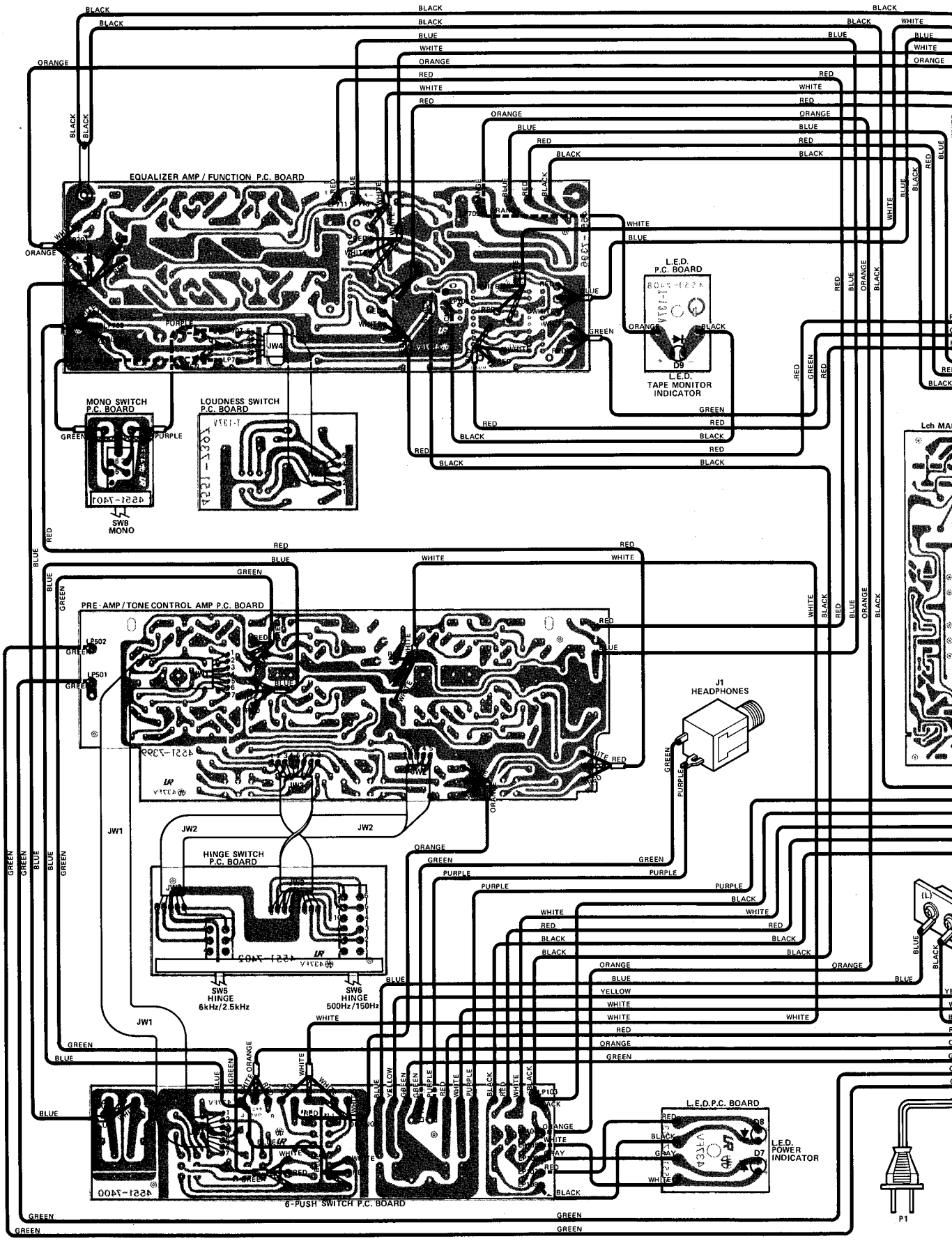
IF UNIT OSCILLATES WHEN FIRST TURNED ON W/ FUNCT. SW. IN PHONO MODE, ADD .01 mfd disc FROM INPUT JACK BRD. SHIELD TO CHASSIS GND TAB NEAR TOP REAR.

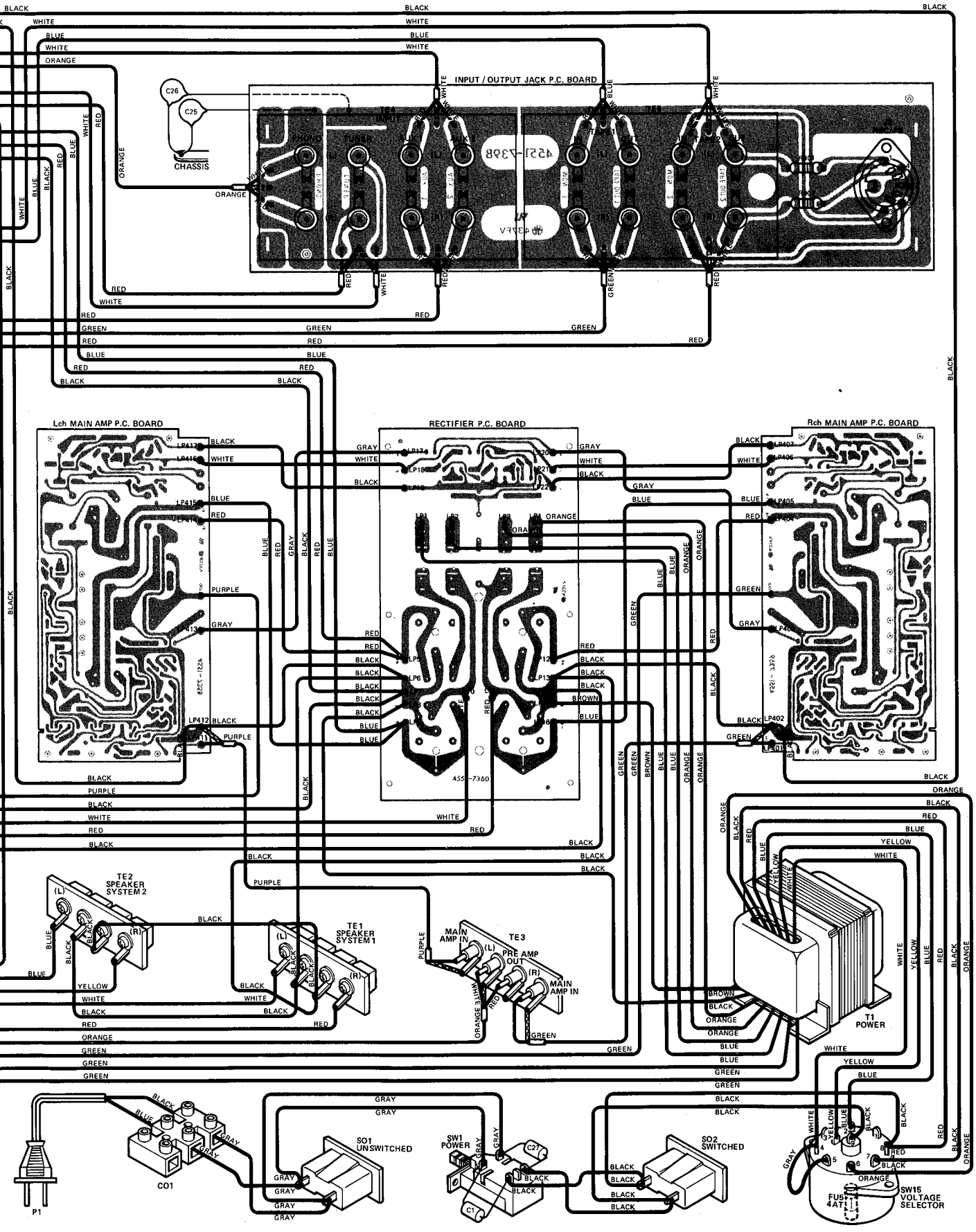


WIRING DIAGRAM – MULTI VOLTAGE



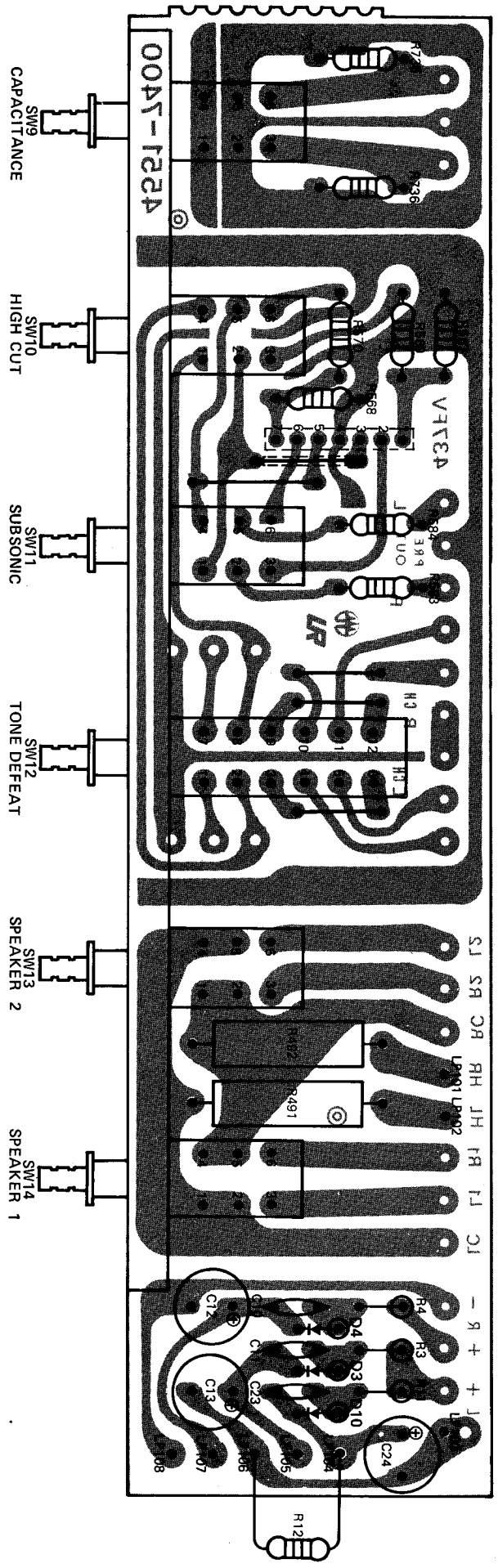
WIRING DIAGRAM – MULTI VOLTAGE



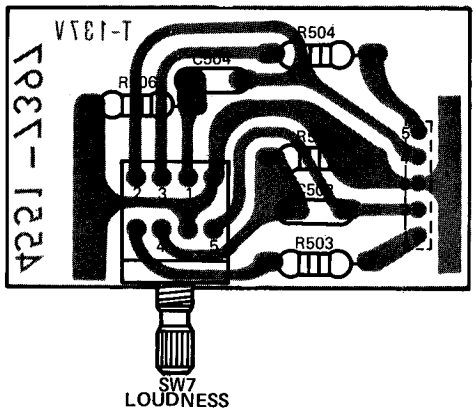

INPUT / OUTPUT JACK P.C. BOARD
C26
C25
CHASSIS
Lch MAIN AMP P.C. BOARD
RECTIFIER P.C. BOARD
Rch MAIN AMP P.C. BOARD
TE2
SPEAKER
SYSTEM 2
TE1
SPEAKER
SYSTEM 1
TE3
PRE AMP
OUT
MAIN
AMP IN
T1
POWER
SO1
UNSWITCHED
SW1
POWER
SO2
SWITCHED
CO1
P1
C1
C21
FU5
4AT
SW15
VOLTAGE
SELECTOR

6-PUSH SWITCH PC BOARD

REF NO.	H/K PART NO.	DESCRIPTION
C12, 13, 24	31835985	Capacitor, 47MF +50% −10% 50V
D3, 4, 10	41631295	Diode, SIB01-02
SW9, 10, 11, 12 13, 14	25035986	Push Switch, Capacitance/ High Cut/Subsonic/ Tone Defeat/Speaker 2/ Speaker 1

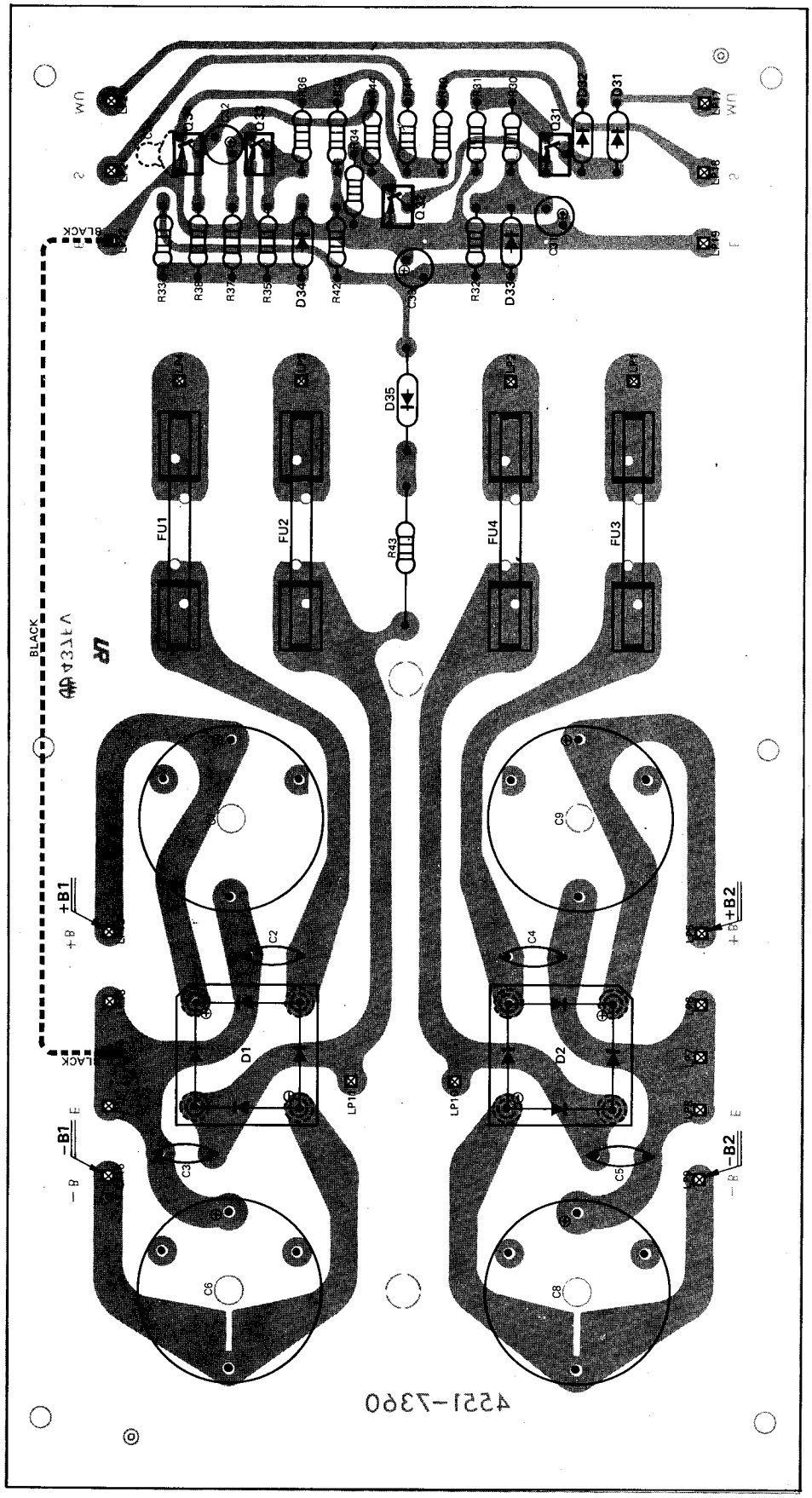


LOUDNESS SWITCH PC BOARD



REF NO.	H/K PART NO.	DESCRIPTION
SW7	24035884	Rotary Switch, Loudness

RECTIFIER PC BOARD



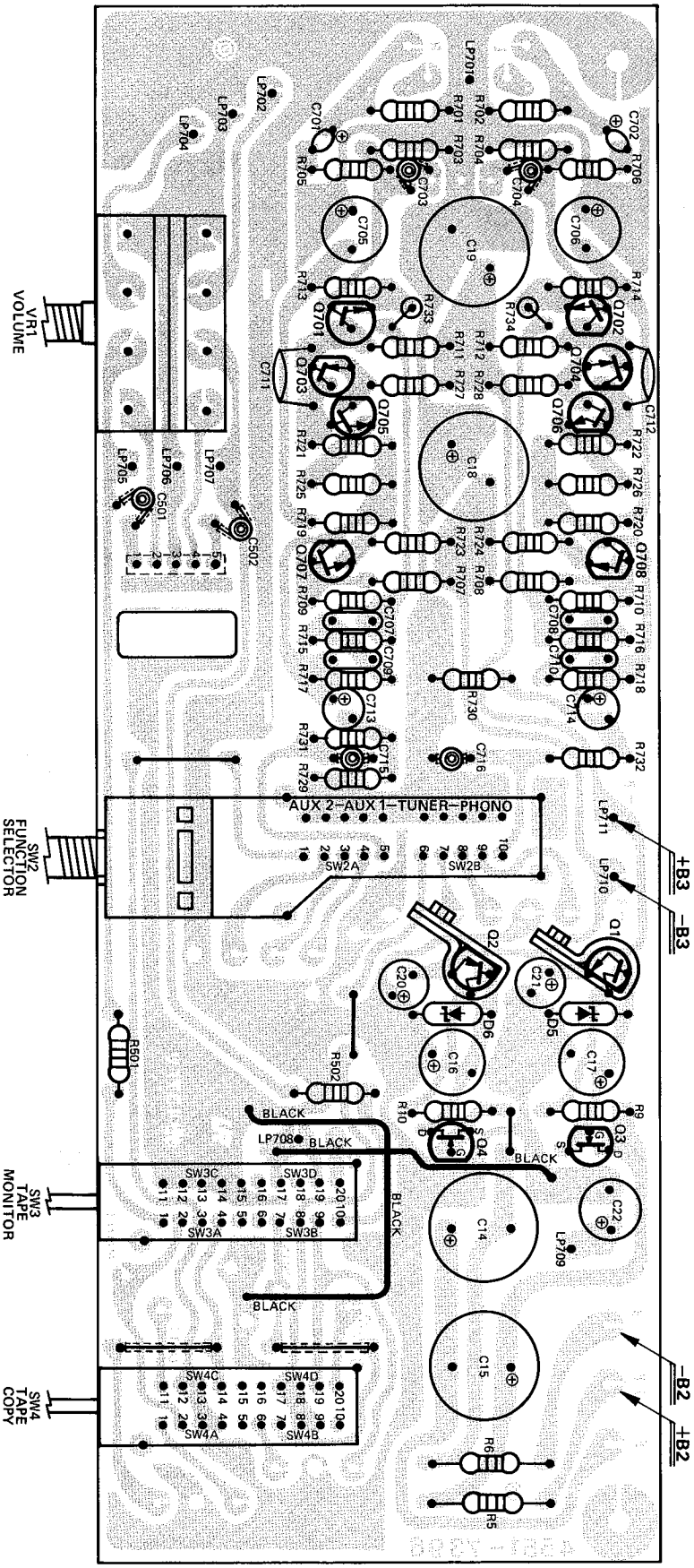
RECTIFIER PC BOARD

REF. NO.	H/K PART NO.	DESCRIPTION
CAPACITORS, ELECTROLYTIC		
C6, 7, 8, 9	31835970	10000MF ± 20% 50V
C31	31835662	47MF ± 20% 10V
C32	31835941	33MF +50% −10% 10V
C33	31835572	22MF +50% −10% 16V
TRANSISTORS		
Q31	43031312	2SA844(E) Audio Muting
Q32, 33, 34	43031312	2SA844(E) Overload Protection Circuit
DIODE		
D1, 2	41035971	Bridge Silicon, S5VB20
D31, 32, 33, 35	41035628	1SS81
D34	42035972	Zener Diode, RD5R1EB 5.1V ± 0.3V
FUSE		
FU1, 2, 3, 4	45035559	4A 125V

EQUALIZER AMP/FUNCTION PC BOARD

REF. NO.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR1	23535871	Variable Resistor, 50 k ohm, Volume Contro
CAPACITORS, ELECTROLYTIC		
C14, 15	31835888	330MF +50% −10% 50V
C16, 17	31835973	47MF +50% −10% 35V
C18, 19	31835974	330MF +50% −10% 35V
C20, 21	31835975	4.7MF +50% −10% 50V
C22	31835976	47MF +50% −10% 50V
C701, 702	31835586	33MF ± 20% 6.3V Tantalum
C705, 706	31835587	330MF +50% −10% 6.3V
C713, 714	31835588	4.7MF ± 20% 25V
TRANSISTORS		
Q1	43035624	2SD667A (C) Voltage Regulator
Q2	43035625	2SB647A (C) Voltage Regulator
Q3, 4	43035874	F. E. T., 2SK106 (C) Voltage Regulator
Q701, 702, 705 706, 707, 708	43035592	2SC1775 (F) Equalizer Amp.
Q703, 704	43032151	2SA872 (E) Equalizer Amp.
D5, 6	42035977	Zener Diode, RD27EB 27V ± 1.9V
MISCELLANEOUS		
SW2	24035978	Rotary Slide Switch, Function Selector
SW3, 4	26535669	Lever Switch, Tape Monitor/Tape Copy

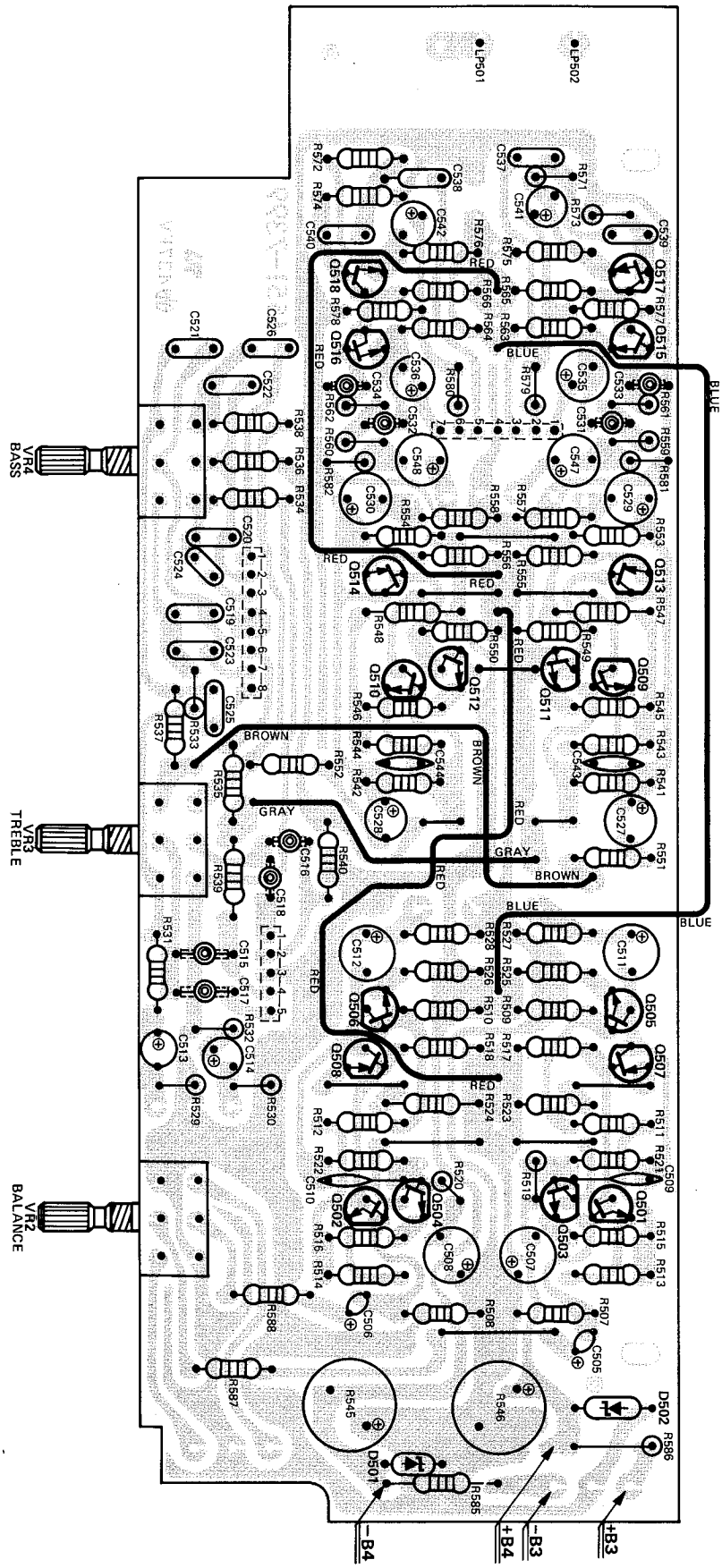
EQUALIZER AMP/FUNCTION PC BOARD



PRE-AMP/TONE CONTROL AMP PC BOARD

REF. NO.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR2	23535979	Variable Resistor, 100 k ohm, Balance Control
VR3, 4	23535980	Variable Resistor, 50 k ohm, Treble and Bass Control
CAPACITORS, ELECTROLYTIC		
C505, 506	30735981	22MF ± 20% 6.3V Tantalum
C507, 508	31835982	220MF +50% −10% 6.3V
C511, 512	31835984	150MF ± 20% 6.3V
C513, 514	31835880	22MF ± 20% 16V
C527, 528	31835662	47MF ± 20% 10V
C529, 530	31835879	100MF ± 20% 10V
C535, 536	31835879	100MF ± 20% 10V
C541, 542, 547 548	31835880	22MF ± 20% 16V
C545, 546	31835720	470MF +50% −10% 16V
TRANSISTORS		
Q501, 503, 505	43035883	2SC1845 (E) } Pre Amp
Q507	43035882	2SA992 (F) } Pre Amp
Q502, 504, 506	43035883	2SC1845 (E) } Pre Amp
Q508	43035882	2SA992 (F) } Pre Amp
Q509, 511	43035883	2SC1845 (E) } Tone Control Amp
Q513	43035582	2SA992 (F) } Tone Control Amp
Q510, 512	43035883	2SC1845 (E) } Tone Control Amp
Q514	43035882	2SA992 (F) } Tone Control Amp
Q515, 516 517, 518	53035883	2SC1845 (E) High-Cut Filter, Subsonic Filter
D501, 502	42032757	Zener Diode, RD15EB 14.7V ± 0.9V

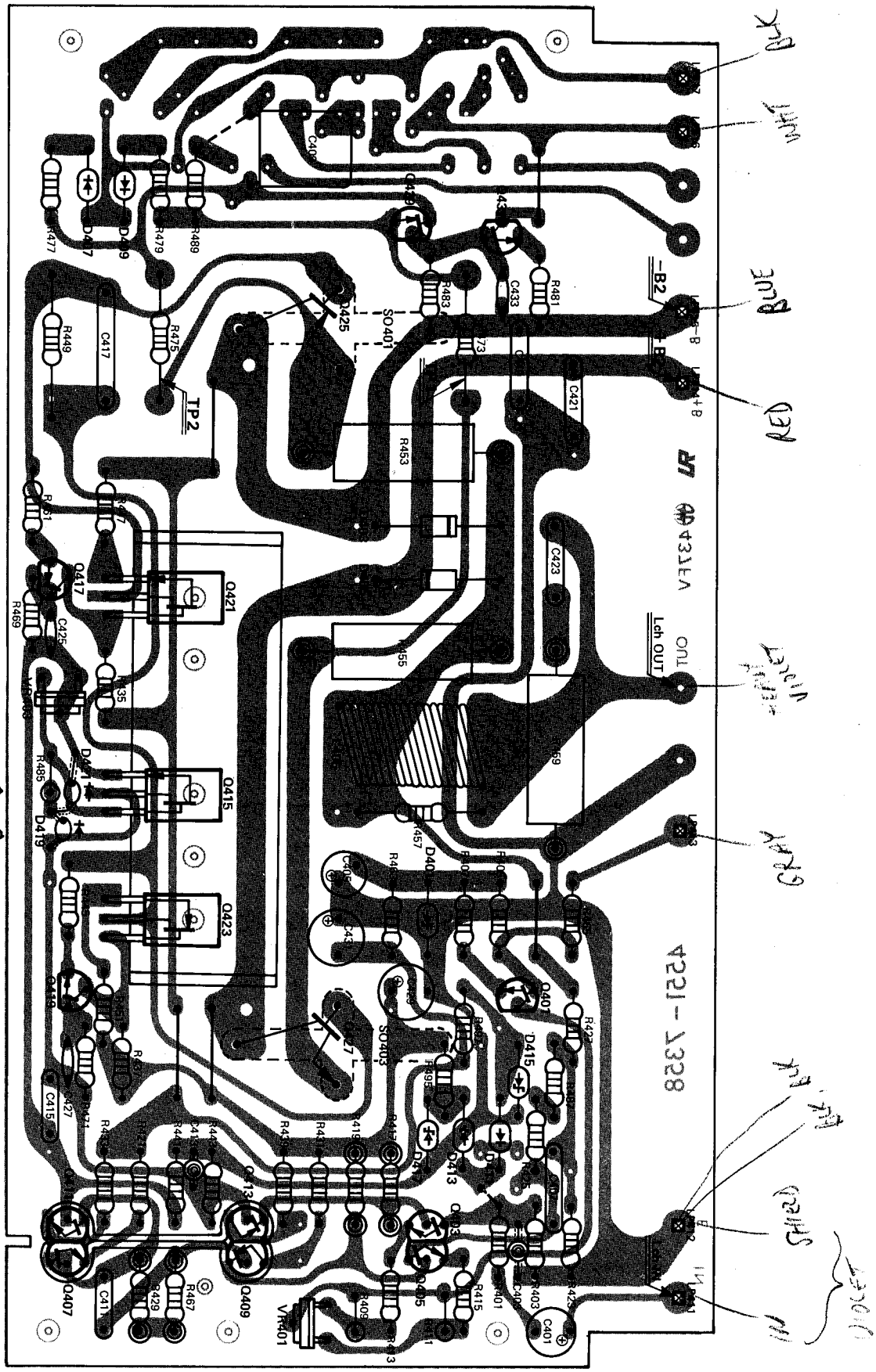
PRE-AMP/TONE CONTROL AMP PC BOARD



L CH MAIN AMP PC BOARD

REF. NO.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR401	23535987	Variable Resistor, 100 ohm
VR403	23535988	Variable Resistor, 2.2 k ohm
CAPACITORS, ELECTROLYTIC		
C401	31835982	220MF +50% −10% 6.3V
C405	31835572	22MF +50% −10% 16V
C429, 431	31835985	47MF +50% −10% 50V
TRANSISTORS		
Q401, 403 405	43035592	2SC1775 (F1) or (F2) or (F3) Current Regulator, Differential Amp.
Q407, 411	43035989	2SD666A (C) } Pre-Driver
Q409, 413	43035990	2SB646A (C) } Pre-Driver
Q415	43035991	2SD415 (Q) Bias Stabilization
Q417	43035625	2SB647A (C) } Driver
Q421	43035992	2SD669 (C) } Driver
Q419	43035624	2SD667 (C) } Driver
Q423	43035993	2SB649 (C) } Driver
Q425	43035994	2SB655A (B) Power Output
Q427	43035995	2SD675A (B) Power Output
Q429	43032151	2SA872 (E) Overload Protection Circuit
Q431	43035592	2SC1775 (F) Overload Protection Circuit
DIODE		
D401	42032757	Zener, RD15EB 14.7V ± 0.9V
D403, 405	41631295	SIB01-02
D407, 409	41035628	1SS81
D411, 413	41028593	1S2076
D415, 417	42035972	Zener, RD5R1EB 5.1V ± 0.3V
D419, 421	41631466	Varistor, MV11Y
COIL		
L405	12035996	RF Choke

L CH MAIN AMP PC BOARD



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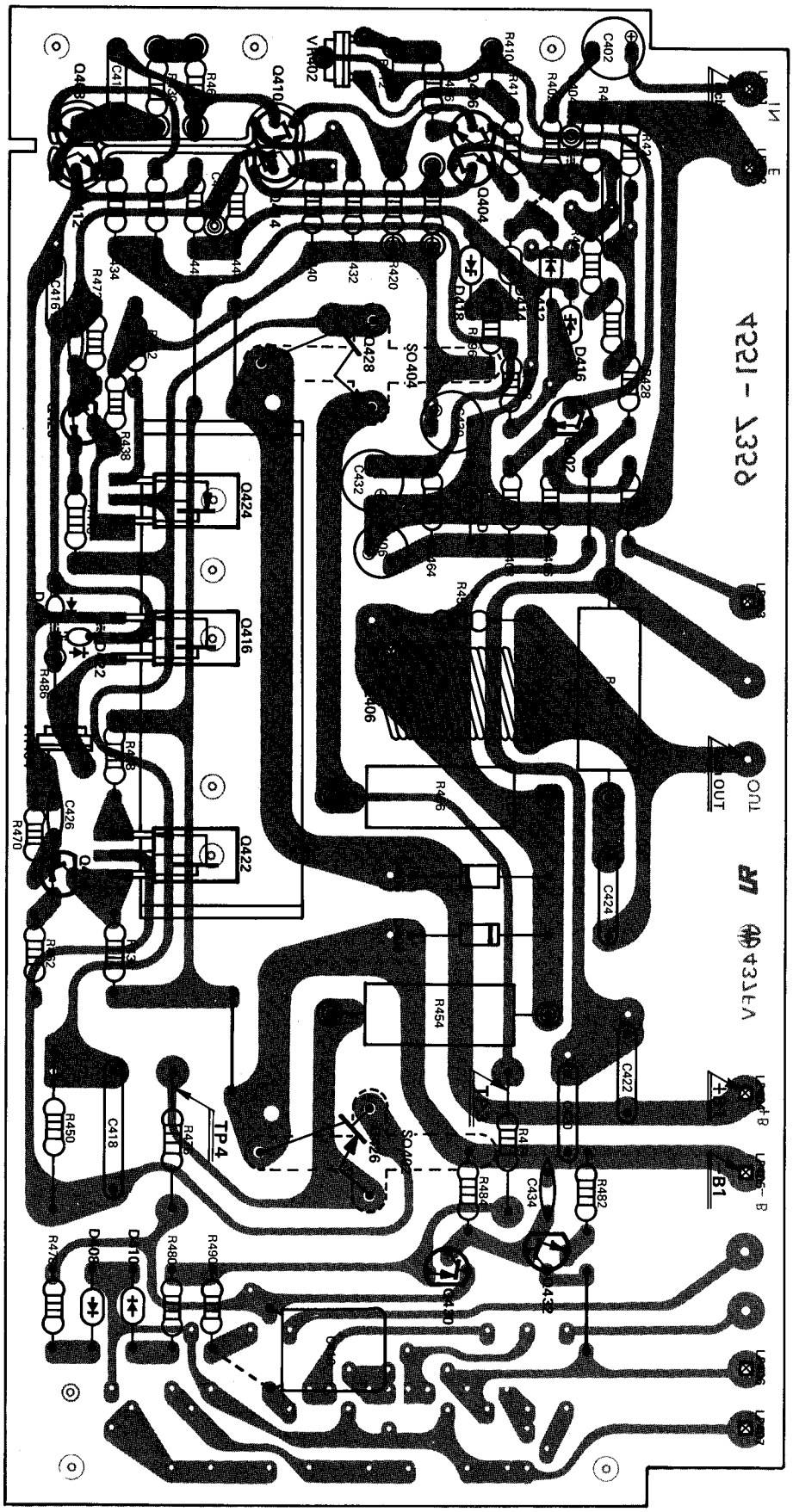
R CH MAIN AMP PC BOARD

REF. NO.	H/K PART NO.	DESCRIPTION
RESISTORS		
VR402	23535987	Variable Resistor, 100 ohm
VR404	23535988	Variable Resistor, 2.2 k ohm
CAPACITORS, ELECTROLYTIC		
C402	31835982	220MF +50% −10% 6.3V
C406	31835572	22MF +50% −10% 16V
C430, 432	31835985	47MF +50% −10% 50V
TRANSISTORS		
Q402, 404, 406	43035592	2SC1775 (F1) or (F2) or (F3) Current Regulator, Differential Amp.
Q408, 412	43035989	2SD666A (C) } Pre-Driver
Q410, 414	43035990	2SB646A (C) } Pre-Driver
Q416	43035991	2SD415 (Q) Bias Stabilization
Q418	43035625	2SB647A (C) } Driver
Q422	43035992	2SD669 (C) } Driver
Q420	43035624	2SD667A (C) } Driver
Q424	43035993	2SB649 (C) } Driver
Q426	43035994	2SB655A (B) Power Ututp
Q428	43035995	2SD675A (B) Power Output
Q430	43032151	2SA872 (E) Overload Protection Circuit
Q432	43035592	2SC1775 (F) Overload Protection Circuit
DIODE		
D402	42032757	Zener, RD15EB 14.7V ± 0.9V
D404, 406	41631295	SIB01-02
D408, 410	41035628	1SS81
D412, 411	41028593	1S2076
D416, 418	42035972	Zener, RD5R1EB 5.1V ± 0.3V
D420, 422	41631466	Varistor, MV11Y
COIL		
L406	12035996	RF Choke

R CH MAIN AMP PC BOARD



CHASSIS PARTS LIST

REF. NO.	H/K PART NO.	DESCRIPTION
GENERAL UNIT		
101	00235856	Front Panel Assembly
102	60135865	Cabinet Top Assembly
108	60135866	Cabinet Back
110	62035544	Feet, Cabinet Bottom (X4)
113	60135756	Bracket, Front Right Side
114	60135757	Bracket, Front Left Side
115	60135758	Knob, Volume/Function (X2)
118	60135760	Knob, Balance/Treble/Bass (X3)
121	60135552	Knob, Tape Monitor/Tape Copy (X2)
125	00235861	Bracket, Front Top
126	63235933	Push Button, Speaker 1, 2/Tone Defeat/ Subsonic/High Cut/Capacitance/Hinge/ Mono (X9)
143	63235932	Knob Base, Volume/Balance/Treble/Bass/ Function (X5)
162	63235863	Knob, Loudness
163	63233663	Push Button, Power
ELECTRICAL		
T1	10135867	Power Transformer
SW1	25035554	Push Switch, Power
SW5, 6	25035868	Push Switch, Hinge 6kHz/2.5kHz, 500Hz/150Hz
SW8	25035869	Push Switch, Mono/Stereo
J1	65432119	Headphones Jack
SO1, 2	65435870	External AC Socket, Unswitched, Switched
TE1, 2	65434823A	Speaker Output Terminal
TE3	65435872	4-Pin Jack, Pre-Amp. Output/Main Amp. Input
TE4, 5	65435873	8-Pin Jack, Phono/Tuner/AUX 1/AUX 2 Input, Tape 1 and Tape 2 Input/Output
D7, 8	46735560	Light Emitting Diode, SLP132B Power Indicator
D9	46735560	Light Emitting Diode, SLP132B Tape Mointor Indicator
	5/032067	
MULTI VOLTAGE AMPLIFIER		
T1	10135997	Power Transformer
SW1	25035635	Push Switch, Power
FU1, 2, 3, 4	45035637	Fuse, 4AT 250V
SW15	24035639	Power Source Voltage Selector
FU5	45035637	Fuse, 4AT 250V
J2	65432127	5-Pin DIN Jack, REC/PB

NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803, Att: Parts Department.